MEDICAL PROCEEDINGS

MEDIESE BYDRAES

A South African Journal for the Advancement of Medical Science

'n Suid-Afrikaanse Tydskrif vir die Bevordering van die Geneeskunde

P.O. Box 1010 · Johannesburg | Posbus 1010 · Johannesburg

Editor : Redakteur

H. A. Shapiro, B.A., Ph.D., M.B., Ch.B., F.R.S.S.Af.

Vol. 6 | 30 Januarie 1960 January 30 | No. 2

REDAKSIONEEL · EDITORIAL

ELI LILLY SE MEDIESE NAVORSINGS-BEURS (SUID-AFRIKA)

GESTIG DEUR DIE KAAPSTADSE NA-GRAADSE MEDIESE VERENIGING

1. Aansoeke om Eli Lilly se Mediese Navorsingsbeurs (Suid-Afrika) word ingewag van behoorlik gekwalifiseerde mediese praktisyns.

2. Die beurs word toegeken vir mediese navorsing, en nie vir na-graadse kliniese studie nie. Dit is geldig vir één jaar.

3. Die waarde van die beurs is 3,600 Verenigde State-dollar vir één jaar, en daarbenewens sal reiskoste betaal word, gebaseer op 'n reisbegroting wat deur die beurshouer ingedien moet word. Dit sal reiskoste en toevallige uitgawes dek vanaf die verblyplek van die beurshouer na die goedgekeurde studieplek in die Verenigde State, sowel as die terugreis.

4. As alle ander dinge gelyk is, sal voorkeur gegee word aan kandidate wat jonger as 40 jaar is.

5. Enige mediese praktisyn wat in Suid-Afrika *geregistreer* is, kan aansoek om die beurs doen.

6. Wat die toekenning daarvan betref, sal geen onderskeid gemaak word op grond van ras, kleur, geloof of geslag nie.

7. Die kandidaat moet bewys lewer van sy bekwaamheid om oorspronklike navorsingswerk te doen.

8. Die kandidaat moet 'n program van sy voorgestelde navorsingswerk indien. Hy word aangeraai om ook 'n alternatiewe skema voor

ELI LILLY MEDICAL RESEARCH FELLOWSHIP (SOUTH AFRICA)

ESTABLISHED BY THE CAPE TOWN POST-GRADUATE MEDICAL ASSOCIATION

1. Applications are invited from suitably qualified medical practitioners for the Eli Lilly Medical Research Fellowship (South Africa).

2. The Fellowship is for the purpose of medical research and is not intended for post-graduate clinical study. It is available for one year.

3. The value of the Fellowship is 3,600 United States dollars for one year and, in addition, travelling expenses will be allowed, based on a travel budget to be submitted by the Fellow. This will cover the cost of travel and incidental expenses from the place of residence of the Fellow to the approved place of study in the United States of America, as well as the return journey.

4. Other things being equal, preference will be given to candidates under 40 years of age.

5. Any medical practitioner *registered* in South Africa will be eligible for this award.

6. There will be no discrimination for the award on grounds of race, colour, creed or sex.

7. The candidate must submit evidence of his capacity to do original research work.

8. The candidate must submit a programme of the proposed research. He is advised to submit an alternative scheme in case of difficulties about the first one.

te lê, net vir geval die eerste plan miskien moeilikhede oplewer.

9. Dit is raadsaam dat die kandidaat moet aandui by watter inrigting hy van plan is om die navorsingswerk te doen, en hy moet ook meld of hy in 'n posisie is om reëlings te tref om navorsingswerk by die genoemde inrigting te onderneem.

10. Die suksesvolle kandidaat moet beloof om na Suid-Afrika terug te keer vir 'n tydperk van ten minste twee jaar ná beëindiging van die toekenning.

11. Die Keurkomitee bestaan uit die volgende:
Dr. H. Brown (*Kaapstad*);
Prof. F. Forman (*Kaapstad*);
Prof. I. Gordon (*Durban*);
Dr. A. Landau (*Kaapstad*);
Dr. D. P. Marais (*Kaapstad*);
Dr. L. Mirvish (*Kaapstad*);
Prof. S. F. Oosthuizen (*Pretoria*);
Mnr. G. Sacks, F.R.C.S. (*Kaapstad*);
Dr. G. Selzer (*Ere-sekretaresse, Kaapstad*);
Dr. H. A. Shapiro (*Ere-voorsitter,* Johannesburg).

12. Aansoeke moet gerig word aan:
Dr. H. A. Shapiro (*Ere-voorsitter*),
Keurkomitee, Eli Lilly se Mediese Navorsingsbeurs (Suid-Afrika),
Posbus 1010, Johannesburg.

Aansoeke moet hom nie later as 30 April 1960 bereik nie.

Hulle moet beknop wees en vergesel gaan van die name van nie meer as twee geskikte persone na wie daar verwys kan word nie. Getuigskrifte moet nie ingesluit word nie.

SKF LABORATORIES SE BEURS VIR NAGRAADSE KLINIESE STUDIE IN SUID-AFRIKA

1960 SE TOEKENNING

Hierdie beurs is moontlik gemaak deur 'n toelae wat deur SKF Laboratories (Pty.) Limited, Posbus 784, Port Elizabeth, beskikbaar gestel is. Die genoemde firma is die Suid-Afrikaanse tak van Smith, Kline and French Laboratories Ltd., Londen.

Die Keurkomitee ('n volkome onafhanklike raad van mediese praktisyns) bestaan uit die volgende:

Prof. J. F. Brock (*Kaapstad*);
Prof. E. H. Cluver (*Johannesburg*);
Prof. G. A. Elliott (*Johannesburg*);
Prof. J. H. Louw (*Kaapstad*);
Dr. H. A. Shapiro (*Ere-Voorsitter, Johannesburg*);
Dr. M. Shapiro (*Johannesburg*);
Dr. M. M. Suzman (*Johannesburg*);
Prof. H. W. Snyman (*Pretoria*).

Aansoeke word ingewag van geregistreerde *algemene praktisyns* wat ten minste 7 jaar lank aktief in Suid-Afrika gepraktiseer het.

9. It is advisable for the candidate to indicate at what institution he proposes to undertake the research and he should also state whether he is in a position to make any arrangements to carry out the research at the proposed institution.

10. The successful candidate must undertake to return to South Africa for a period of at least two years after the termination of the award.

11. The Selection Committee consists of:
Dr. H. Brown (*Cape Town*);
Prof. F. Forman (*Cape Town*);
Prof. I. Gordon (*Durban*);
Dr. A. Landau (*Cape Town*);
Dr. D. P. Marais (*Cape Town*);
Dr. L. Mirvish (*Cape Town*);
Prof. S. F. Oosthuizen (*Pretoria*);
Mr. G. Sacks, F.R.C.S. (*Cape Town*);
Dr. G. Selzer (*Honorary Secretary, Cape Town*);
Dr. H. A. Shapiro (*Honorary Chairman, Johannesburg*).

12. Applications must be forwarded to:
Dr. H. A. Shapiro (*Honorary Chairman*),
Selection Committee, Eli Lilly Medical Research Fellowship (South Africa),
P.O. Box 1010, Johannesburg.

They must reach him not later than 30 April 1960.

They should be concise, and accompanied by the names of not more than two suitable referees. Testimonials must not be included.

SKF LABORATORIES AWARD FOR POST-GRADUATE CLINICAL STUDY IN SOUTH AFRICA

1960 FELLOWSHIP

This award has been established by a grant from SKF Laboratories (Pty.) Limited, P.O. Box 784, Port Elizabeth. This is the South African branch of Smith, Kline and French Laboratories Ltd., London.

The Selection Committee (an entirely independent board of medical practitioners) consists of the following:

Prof. J. F. Brock (*Cape Town*);
Prof. E. H. Cluver (*Johannesburg*);
Prof. G. A. Elliott (*Johannesburg*);
Prof. J. H. Louw (*Cape Town*);
Dr. H. A. Shapiro (*Honorary Chairman, Johannesburg*);
Dr. M. Shapiro (*Johannesburg*);
Dr. M. M. Suzman (*Johannesburg*);
Prof. H. W. Snyman (*Pretoria*).

Applications are invited from registered *general practitioners* who have been in active practice in South Africa for at least 7 years.

Die Beurs is bedoel vir na-graadse kliniese studie en nie vir mediese navorsing nie. Dit is beskikbaar vir 'n tydperk van ten minste 2 maande aan enige Mediese Skool in Suid-Afrika.

Die totale waarde van die beurs is £300.

Die kandidaat moet 'n kort uiteensetting van sy voorgestelde studiekursus verstrek, en hy moet aandui by watter inrigting hy hierdie kursus wil loop.

Geen geld sal aan die suksesvolle aansoeker uitbetaal word nie totdat hy die Keurkomitee tevrede gestel het dat hy aangeneem is vir die tydperk van na-graadse studie aan 'n Suid-Afrikaanse Mediese Skool.

Aansoek moet gedoen word op die voorgeskrewe vorm wat verkrygbaar is van:

Dr. H. A. Shapiro (*Ere-Voorsitter*),
Keurkomitee,
SKF Laboratories se Beurs vir Na-Graadse Kliniese Studie,
Posbus 1010, Johannesburg.

Die sluitingsdatum vir aansoeke is 30 Junie 1960.

The Bursary is intended for post-graduate clinical study and not for medical research. It is available for not less than a 2-month period at any Medical School in South Africa.

The total value of the Bursary is £300.

The candidate must submit a brief statement of his proposed course of study and indicate the institution at which he intends to undertake it.

No payments will be disbursed to the successful applicant until he has satisfied the Selection Committee that he has been accepted for the period of post-graduate study at a South African Medical School.

Applications must be made on the prescribed form which is obtainable from:

Dr. H. A. Shapiro (*Honorary Chairman*),
Selection Committee,
SKF Laboratories Award for Post-Graduate Clinical Study,
P.O. Box 1010, Johannesburg.

Closing Date for Applications: 30 June, 1960.

ANNOUNCEMENT

THE ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

MAUDSLEY BEQUEST

A TWO-DAY LECTURE COURSE

has been arranged at

THE ROYAL SOCIETY OF MEDICINE

1 Wimpole Street, London, W.1 on Monday and Tuesday, 8 and 9 February 1960

PROGRAMME

First Day: 8 February 1960:

10.00 a.m.—11.15 a.m. *Treatment in Child Psychiatry.* Dr. Kenneth Cameron.

11.30 a.m.—12.45 p.m. *Treatment Problems in Adolescents.* Dr. Henry Wilson.

2.00 p.m.—3.15 p.m. *Psychotherapy and Conditioning.* Dr. George Sutherland (U.S.A.).

3.30 p.m.—4.45 p.m. *The Brain as a Machine.* Dr. Grey Walter.

Second Day: 9 February 1960:

10.00 a.m.—11.15 a.m. *The Treatment of Depressions.* Dr. Alick Elithorn.

11.30 a.m.—12.45 p.m. *Suicide.* Prof. Erwin Stengel.

2.00 p.m.—3.15 p.m. *Psychiatric Treatment in General Hospitals.* Dr. William Sargant.

3.30 p.m.—4.45 p.m. *The New Mental Health Act.* The Hon. Dr. Walter Maclay.

Each lecture will be followed by questions from the audience.

Admission is by ticket and is open to members of the Royal Medico-Psychological Association and to others who signify their intention of joining the Association before February 1961.

Applications for tickets should be made as soon as possible to The Secretary, Royal Medico-Psychological Association, 11 Chandos Street, Cavendish Square, London, W.1, England.

ABSTRACTS

PAIN IN CORONARY INSUFFICIENCY

The pain in *coronary insufficiency* may be so similar to that caused by *hiatus hernia* that differential diagnosis is difficult. The following findings suggest hiatus hernia: pain occurs when the patient lies down or bends, or after meals; the pain radiates to the right shoulder; atropine produces marked alleviation, while the response to nitroglycerine is less good.

[Halonen, P. I. and Seppälä, T. (1958): Ann. Med. Int. Fenniae, **47**, 121].

THE AORTIC WALL AND COAGULATION

In the *aortic wall* a substance has been found which, to judge from its nature, appears to be a mucopolysaccharide-protein complex. As it is similar to *elastin*, it is perhaps the initial product for the replacement of destroyed or degenerated elastic fibres. It also possesses an inhibitory effect on coagulation, which is similar to but considerably weaker than that of heparin.

[Yu, S. Y. and Blumenthal, H. T. (1958): J. Geront. (U.S.A.), **13**, 366].

OBSTETRICAL VESICO-VAGINAL FISTULAE

REPORT ON A FURTHER SERIES, WITH SPECIAL REFERENCE TO THE STRESS INCONTINENCE RESULTING AFTER REPAIR

DENIS W. P. LAVERY *

Department of Obstetrics and Gynaecology, Baragwanath Hospital and University of the Witwatersrand, Johannesburg, South Africa

Genito-urinary fistula, more commonly known and referred to as vesico-vaginal fistula, continues to be a major complication of childbirth among our African parturients.

In the years 1954–1958, 262 patients with a variety of types of urinary fistulae were admitted to the gynaecological wards of this hospital and were attended to by the author. A further group of patients has been attended to by other members of the staff.

Since 1951 the author has operated on no less than 466 patients with genito-urinary fistula.

One has often been asked to state the incidence of this complication, but no satisfactory answer can be given. Birth rates are impossible to compile because large numbers of babies are never registered; stillbirths and perinatal deaths are not recorded and, most important, the patients who attend this hospital come from many parts of the Transvaal and even from other provinces.

A further difficulty is encountered in trying to estimate an incidence by virtue of the fact that some of our patients have had the fistula for many years. The age of the fistula in the first reported series from this hospital varied between 1 month and 96 months—average 20.8 months; while in this series this age has decreased to an average of 15.4 months.

The number of patients who suffer this complication, therefore, cannot be calculated against delivery rate, but can only be expressed as a gynaecological incidence in a general hospital gynaecological practice. The figure for this hospital is 1.9% of 24,000 admissions.

In spite of a reduction in the age of the fistula among our patients, the problem of scar tissue formation was encountered with much the same incidence as before. Various factors must be invoked to account for this unusual scarring of tissues in Bantu patients, an important one being the tendency for these patients to heal by production of keloid material. The constant saturation of the vaginal tissues by urine, long duration of the fistula and, of course, the compression necrosis with subsequent slough formation, all play a part in the production of a severe degree of the scar tissue in the cases at this hospital.

Marked scarring of the vagina was associated with gross vaginal stenosis in 12 patients of the series, and with moderate scarring in 86 patients. This scarring was responsible for the completely non-functional vaginae of some patients after repair of the fistula.

In this report it is not intended to present the cases in detail or to describe the operation. Suffice it to say that, apart from one or two small changes in technique, the method employed for repair of the fistulae followed the principles described in a previous report.[1]

The changes in the operative technique are worthy of mention, because one is of the opinion that these have contributed to the successful outcome of the operations. Firstly, the fine 00 chromic catgut used previously, is now supplied attached to an atraumatic, half-circle needle of considerable strength. This needle is supplied in either round-bodied or inverted triangular cutting forms. There is no doubt that this 'Ethicon' atraumatic needle has been a major advance in the vaginal repair of urinary fistulae. The catheter, which is attached to a bridge suture of silk, placed between the labia majora, is left *in situ* for much longer periods than was the case before. This has, in our opinion, contributed to a reduction in size of any residual fistulae which may develop, and has permitted solid healing to occur in successful repairs.

This indwelling catheter may remain in the bladder for 5–7 days longer because, by the use of long-acting sulphonamides combined with tri-daily irrigation of the catheter and bladder with 'G' solution, no untoward complications *per se* arose.

Lastly, the self-retaining catheter used previously was of the de Pezzer type. In the addendum to the previous report, note was made of a peculiar type of urethral condition, viz. split urethral canal. This proved to be

*Senior Obstetrician and Gynaecologist.

the result of inexpert removal of the catheter, which caused the damage described. To obviate this, it is now our custom to remove the bulb of the catheter and to cut holes in the distal 1½ inches of the remainder. This has resulted in more satisfactory bladder drainage, less blocked catheters and, of course, a disappearance of 'split urethra.'

The results of the operations on these 262 patients are as follows:

The fistula was closed after one operation in 87.7% of cases. In 10.4% the patients required multiple operations to effect closure. The maximum number of operations per patient in this series was 4, with an average of 2. This was an improvement on the previously reported series and the credit must go in part to the modifications mentioned above.

In 6 patients (1.9%) the fistula could not be closed. Two patients had such gross destruction and loss of tissue that no attempt at repair was considered feasible. In 2 patients failure was obvious after 2 attempts had been made. In one case the fistula was the result of an unsuspected carcinoma of the bladder and the condition was diagnosed at the second attempt at closure. In the remaining case the fistula was closed successfully, but a severe degree of stress incontinence resulted which incapacitated the patient to the same degree as had the fistula.

The ureters were transplanted in these 6 patients. In 4 the isolated ileal sac technique was used and in 2 the ureters were transplanted into the sigmoid colon.

A feature of this series was the development of a severe degree of stress incontinence in patients in whom the fistula had been closed successfully. The mechanism of production of this incontinence was ascribed to the dragging down of the inferior lip of the external urinary meatus by the contraction of the healing tissue of the suture line of the fistula, plus immobilization of the urethral canal in scar tissue.

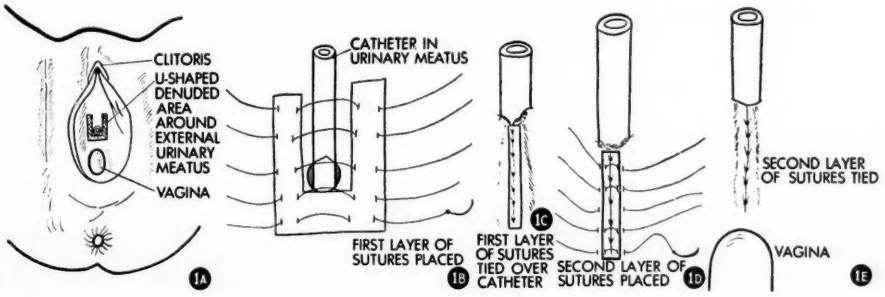
The incontinence produced a degree of wetness indistinguishable from that of a fistula, and was just as distressing. This complication occurred in 62 patients (27.5% of the cases in this series) whereas in the previous series, the incidence was 42 patients (20.5%). The increased incidence was probably due in part to the fact that the present series contained more of the severe types of fistulae, the less severe types being given to other senior and junior members of staff, in order that they might become familiar with this type of operative procedure on relatively simple types of fistula.

Because the incontinence is due to a mechanical process, the familiar operations designed and described for the treatment of stress incontinence could not be utilized and some modification had to be devised to meet this contingency. Two procedures were elaborated in the Unit, which met with some success.

The first operation was 'simple elongation of the urethra.' Fig. 1 is a schematic representation of this operation. In Fig. 1A the relationship of the incision to the urethra is shown.

It will be noted that this incision is U-shaped and that the crossbar of the U includes the inferior edge of the external urinary meatus. The upright arms of the U extend upwards around the meatus towards the clitoris for a distance of ¾ inch. The skin in the shaded area is removed, which then leaves a small strip of skin above the external urinary meatus. This strip of skin will grow round and will eventually epithelialize the new tube.

Fig. 1B depicts only the incision area and shows how the sutures of 00 chromic catgut on a half-circle, round-bodied atraumatic needle are placed in this denuded area. The sutures pass from one side, over a de Pezzer catheter (size 16) with the bulb removed and placed in the bladder, to the other side. The sutures are placed and held until all are in position. They are then tied, using a double reef knot, and the ends are cut very short. It was found advisable to commence tying the sutures at the



' cross bar ' and then to proceed upwards. Fig. 1C shows these sutures tied, thus approximating the two raw areas and burying the catheter. Fig. 1D demonstrates the placing of the second layer of sutures. The needle enters the skin about ⅛ inch from the edge of the incision, taking a good bite of the remaining denuded area, passing over the buried catheter and out on the other side in the same manner. It will be noticed that these sutures are placed so as to alternate with the first layer of sutures. Fig. 1E shows the second layer of sutures tied and cut short.

The catheter is anchored to a ' bridge ' stitch placed on the mons veneris. The patient is returned to the ward and the catheter is connected to a continuous suction apparatus which maintains constant suction for 21 days.

The catheter is irrigated thrice daily with a measured quantity of G ' solution, usually not more than 2 oz., which assists in keeping it patent. The patient is given long-acting sulphonamide for the entire period of bladder drainage.

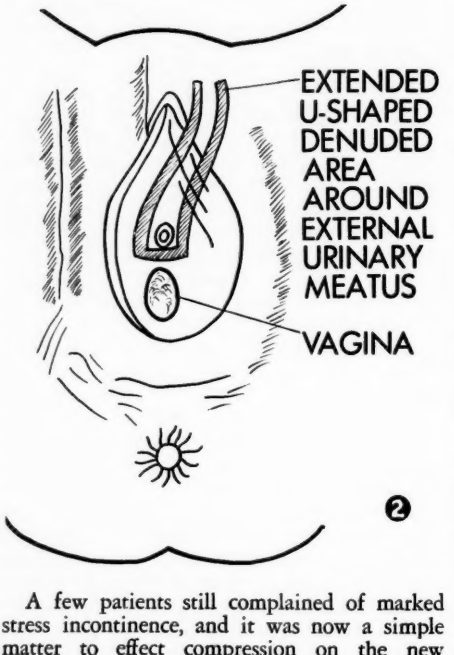
This simple operation produced satisfactory results in a good proportion of these cases and patients were continent. However, some degree of stress incontinence persisted in the remainder, and during post-operative, pre-discharge examination it was discovered that light pressure over the newly-placed meatus could effect continence during coughing and straining.

To produce this pressure constantly, an appliance was designed with special orthopaedic elasticized webbing made into a belt or waist band. This rested on the iliac crests and was fastened off-centre by means of a buckle. At the back of this waist band, over the natal cleft, a piece of webbing, 1 inch wide, was stitched. This strip of webbing passed forwards over the anus and vaginal introitus, pressed on the new meatus and was adjusted in front by passing into a buckle fastened to the waist band. In the region of the vagina and the new ' meatus ' the webbing was replaced by a piece of soft pliable leather with a small area of reinforcing over the meatus.

This appliance, although not very comfortable, was effective in producing continence in the remainder of these patients.

In 1957 and 1958 this operation was modified with a significant increase in continence without external aids. Fig. 2 shows schematically the situation of the new incision. It will be noticed that the upright arms of the U incision have been elongated upwards. The incisions pass slightly laterally towards the labium minus, through this structure and then occupy the groove between the labium minus and major up to a point a little above and lateral to the clitoris. It is necessary to ensure that the strip of skin remaining between the 2 arms of the elongated U contains no hair follicles.

The remaining steps in the operation were identical to those already described in Fig. 1. A smaller catheter was used in this new operation in order to keep the lumen of the tube produced as small as possible. A size 14 or 16 de Pezzer catheter with the bulb removed was passed into the bladder via the patulous urethra and was buried as described in the first operation.



A few patients still complained of marked stress incontinence, and it was now a simple matter to effect compression on the new meatus, because it was placed in a more favourable position near the symphysis.

At about this time a number of the patients wearing the belt designed after the first operation, informed us that the belt was uncomfortable, irritating and that the loop was easily soiled.

We modified the belt by replacing the single loop with 2 loops fastened at the back of the waist band, which passed forwards in the gluteal clefts and met in front just over the symphysis, where the pressure was required. In this way contact with the anus and vagina was avoided. This belt had to be fitted to

each individual patient, and was found to be comfortable and efficacious.

This latter operation plus, in a few cases, the specially designed belt, succeeded in overcoming the distressing complications of post-vaginal repair stress incontinence, and was instrumental in avoiding the more serious method of obtaining a state of dryness, viz. ureteric transplantation into ileal sac or sigmoid colon. This, we feel, is a step in the right direction, in spite of the fact that there is no physiological or anatomical basis for the operation described.

It has been our practice in this Unit to advise those patients in whom one has failed to attain continence of urine by the methods described, and who require deviation of the urinary stream, to have ureters transplanted into an isolated loop of ileum. We are of the opinion that this operation is superior to other forms of ureteric transplantation because the disturbance of electrolyte balance is minimal and the chances of ascending infection to the kidneys are very greatly reduced.

However, it does seem as though we will have to abandon this operation, because it is not acceptable to our African patients, particularly those who come from the more remote areas of the country.

On three occasions the ileal sac transplant has been completed very successfully and the patient has then requested removal of the skin stoma because it was quite unacceptable. The first patient was ready for discharge from hospital and refused to leave until the ileal stoma was removed. She had suffered at the time of the occurrence of the large vesico-vaginal fistula, an enormous destruction of rectal tissue which prevented repair. When it was pointed out to her that the ileal sac would have to be implanted into the bladder with consequent incontinence and that we were very loth to do this, she threatened to commit suicide unless we met her request. In her opinion incontinence was preferable to disfigurement of her beauty!

The second patient returned to the Unit after a year and requested disconnection of the sac. In the third case, we flatly refused to disconnect the sac and the patient acceded with bad grace.

The ileal sac in the first patient was dissected free of the anterior wall. The open end was then closed and the previous closed end was re-opened and implanted into the bladder. In some mysterious manner she remained continent in spite of a hole in the bladder some 1½ inches across! In the second case the ileal sac was freed from the anterior abdominal wall. This end was closed and the closed end re-opened and anastomosed end-to-side to the sigmoid colon.

Nine patients in this series who had had a fistula repaired in this Unit more than 4 years before returned with a fresh fistula which occurred after vaginal delivery of a full-time infant.

Our policy in regard to subsequent pregnancies is to advise patients upon discharge from the Unit to return to us for antenatal care and delivery by means of caesarean section. Most patients follow this advice but on occasion some, probably frightened by the thought of laparotomy, fail to tell the attendants about the previous fistula—with disastrous results. Two patients, however, were fortunate enough to escape a recurrence of a fistula after delivery of a premature baby.

A type of fistula which caused much trouble was the vesico-utero-cervico-vaginal fistula. It is extremely difficult to establish the exact nature of such fistulae and, unless this is done, the vaginal approach is doomed to failure. If vaginal repair is the method chosen, the steps in the operation are those of anterior colporrhaphy. The bladder is mobilized until the apex of the deficiency in the uterus is visualized. This is repaired and then the bladder fistula is closed separately. There were 4 such types of fistula in this group of cases; 3 were repaired via the vaginal route and one required trans-abdominal, trans-vesical repair.

Recto-vaginal fistulae were present in only 8 of the vesico-vaginal fistula patients. In 4 of these the size of the fistula and loss of tissue was so great that a permanent end colostomy was necessary. In 4 others a temporary loop colostomy was necessary to avoid soiling of the healing area of the vesico-vaginal fistula. The recto-vaginal fistulae were then converted into third degree tears and repaired as such after granulation had occurred.

SUMMARY AND CONCLUSIONS

Vesico-vaginal fistulae continue to create a problem among African parturients in South Africa.

The present report deals with a further 262 patients attended to by the author, bringing his personal series to 466 cases reported.

The fistula was repaired for the most part via the vaginal route. Success was possible after one operation in 87.7% of cases; 10.4% required multiple operations to effect closure of the fistula. The maximum number of operations on any one patient was 4.

The fistula could not be closed in 6 patients (2.2%) and if the case of carcinomatous fistula is excluded, the corrected rate is 5 cases (1.9%).

The ureters had to be transplanted in these cases. The method of choice was to transplant the ureters into an isolated loop of ileum. However, this operation (although superior to the uretero-sigmoid transplant) is being abandoned because it is not acceptable to our type of patient.

Stress incontinence following successful closure of the fistula produced a major problem and occurred in 27.5% of the series. An operation was evolved which controlled the major percentage of this complication, the balance obtaining control with the assistance of a specially designed and fitted belt which exerted pressure over the new meatus.

I wish to thank the Medical Superintendent for permission to use the case histories of patients in this hospital.

A special word of thanks is due to the members of the orthopaedic workshops for their patience and skill in devising the belts described.

REFERENCE

1. Lavery, D. W. P. (1955): J. Obstet. Gynaecol. Brit. Emp., **62**, 530.

ELECTROCARDIOGRAPHIC CHANGES IN SURGERY OF THE EYE

A PRELIMINARY REPORT

R. A. TROPE,* M.B., B.CH. (RAND), D.O.M.S., R.C.P. & S. (ENG.)

and

D. ROSENZWEIG,† M.B., CH.B. (PRET.)

Baragwanath Hospital and the University of the Witwatersrand, Johannesburg

The original description of changes in cardiac rhythm following pressure applied to the eyeballs, by Ashner[1] and Dagnini[2] working independently in 1908, first focused attention on the oculo-cardiac reflex. More recently, Kirsh, Samet, Kugel and Axelrod,[3] reporting on electro-cardiographic changes in 50 cases (including extra- and intra-ocular surgical operations) observed that changes occur in 30% of cases except where retrobulbar injections had been given. In these cases, *no changes* were elicited and they concluded that retrobulbar injection of Lidocaine 1% represents the 'first demonstration in man of complete and unfailing prevention . . . of the electrocardiographic changes brought about by ocular stimulation of the trigemino-vagal reflex.' Bosomworth, Ziegler and Jacoby[4] studied 62 patients and concluded that retrobulbar block has little effect in blocking the oculo-cardiac reflex (12 out of 17 cases), whereas intra-venous Atropine prevented the occurrence of cardiac changes in 16 of 17 cases.

The purpose of this paper is an attempt to re-evaluate the possible changes in cardiac rhythm during ophthalmic operations 'particularly as we have come to rely on retrobulbar anaesthesia and thought it to be effective.'[5]

METHODS AND MATERIALS

Thirty-eight random patients undergoing various eye operations were studied. Each patient first underwent routine medical examination and electrocardiography. The operations consisted of cataract extractions, enucleations, strabismus corrections and plastic operations on the eyelids. The ages varied from 2 to 80 years. Premedication consisted of a combination of some of the following drugs: subcutaneous Atropine in all cases, with one or more of the following—Pethidine, Omnopon, Scopolamine, Largactil, Diamox.

The general anaesthetics used were intravenous Sodium Pentothal, Nitrous Oxide and Oxygen with muscle relaxants, usually Scoline and occasionally Curare or Tubarine. In some cases Trilene, Trilene and Ether, or Vinesthene were used.

Local anaesthesia consisted of Decicain or Pontocaine drops to the eyes, retrobulbar block with Xylocaine 2% and/or local infiltration with Xylocaine.

Anaesthesia consisted of either general, local or a combination of one of the general anaesthetics with retrobulbar anaesthesia. A direct-writing electrocardiogram was used during the operation.

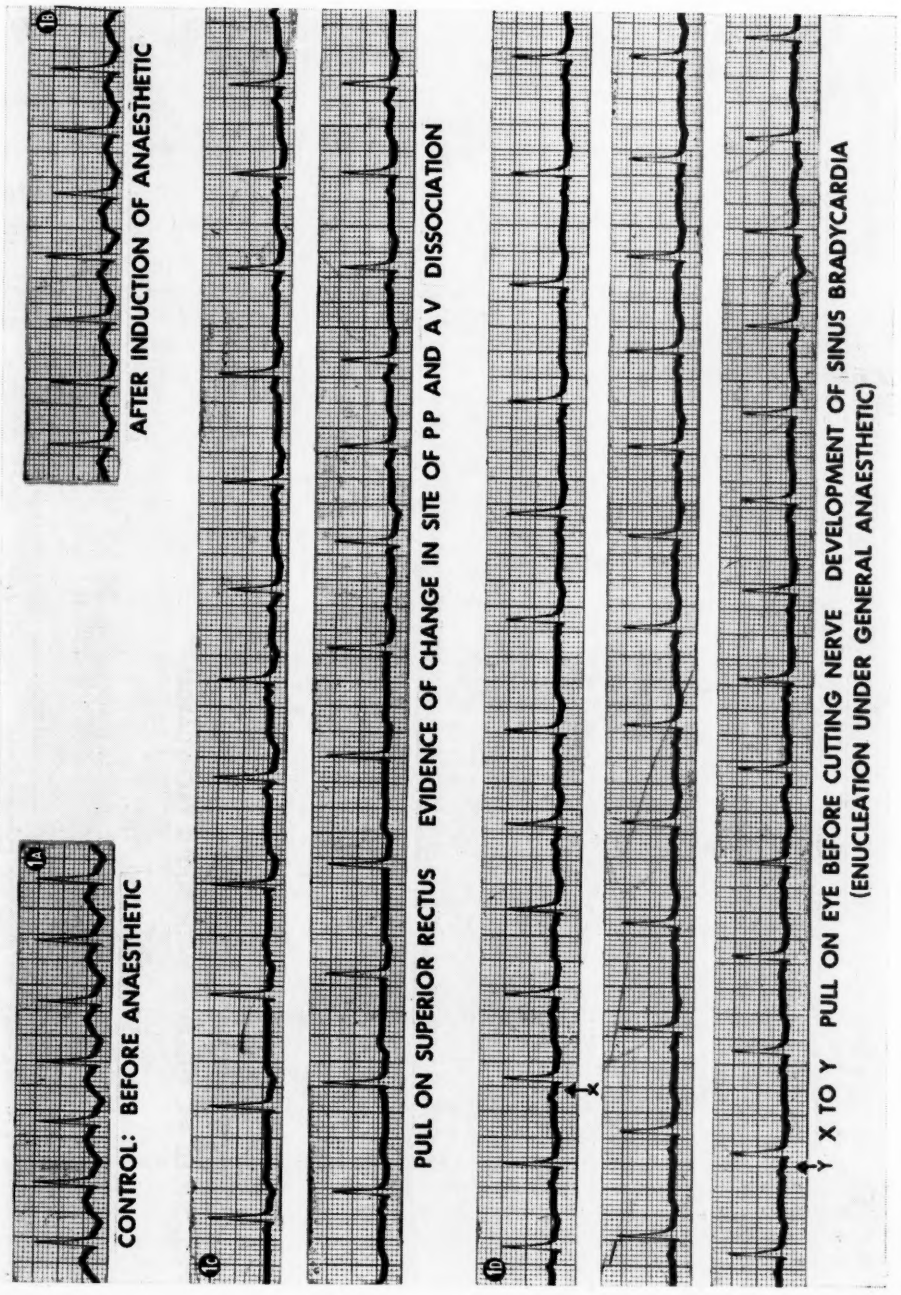
* Head of the Department of Ophthalmology and Part-time Senior Ophthalmologist, Baragwanath Hospital and the University of the Witwatersrand, Johannesburg.

† Medical Registrar, Baragwanath Hospital.

RESULTS

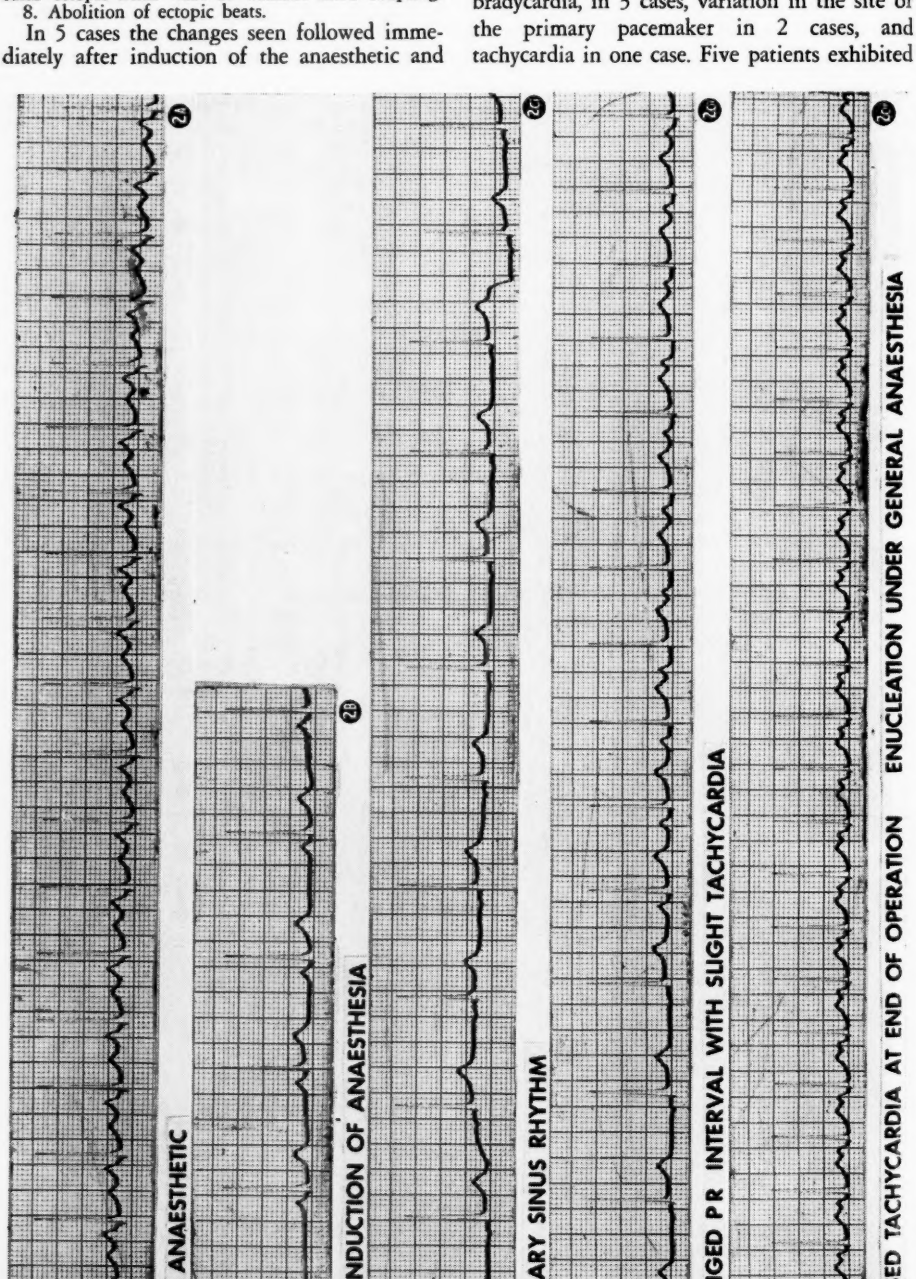
The following changes were noted:

1. Transient tachycardia.
2. Sinus depression (bradycardia).
3. Auriculo-ventricular dissociation with nodal rhythm.
4. Shift in the site of the primary pacemaker.
5. Variation in the P-R interval.
6. Changes in the T wave.



7. Ectopic beats: auricular ectopic beats, ventricular ectopic beats with or without fixed coupling.
8. Abolition of ectopic beats.

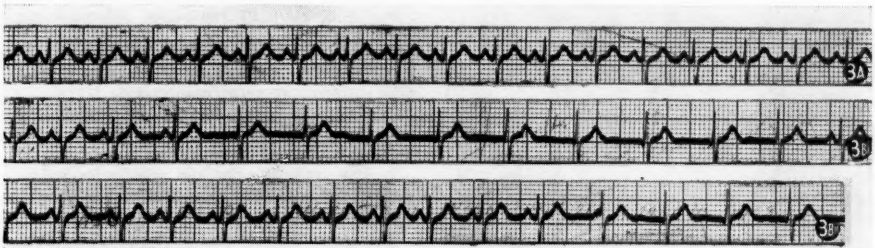
In 5 cases the changes seen followed immediately after induction of the anaesthetic and were not due to the operation. These were bradycardia, in 3 cases, variation in the site of the primary pacemaker in 2 cases, and tachycardia in one case. Five patients exhibited



variation in the site of the primary pacemaker before the operation, 12 during the course of the operation and 2 following induction of the anaesthetic before the commencement of surgery.

No cases of cardiac arrest were seen during the course of this study. The tracings (Figs. 1–5) indicate some of the changes registered.

Figs. 1, 2 and 3 were obtained under general anaesthesia.



3 A – CONTROL
3 B (i & ii) – CONTINUOUS STRIP SHOWING DEVELOPMENT OF NODAL RHYTHM ENUCLEATION UNDER GENERAL ANAESTHESIA

Electrocardiographic changes noted by us during the course of ocular operations were as follows:

1. No change, 26.3% (10 cases). 5 GA; 4 LA; 1 GA & R R.
2. Bradycardia, 34.2% (13 cases). 4 GA; 8 LA; 1 GA & R R.
3. AV dissociation and nodal rhythm, 15.8% (6 cases). 4 GA; 1 LA; 1 GA & R R.
4. Change in PP, 31.6% (12 cases). 2 GA; 10 LA.
5. Change in PR 2, 6% (1 case). 1 LA.
6. ST & T wave changes, 5.3% (2 cases). 2 LA.
7. Ectopic beats, 10.5% (4 cases). 1 GA; 3 LA.
8. Abolition of ectopic beats, 7.9% (3 cases). 1 GA; 2 LA.

(GA = General anaesthesia; LA = Local anaesthesia; GA + R R = General with retrobulbar anaesthesia; PP = Primary pacemaker).

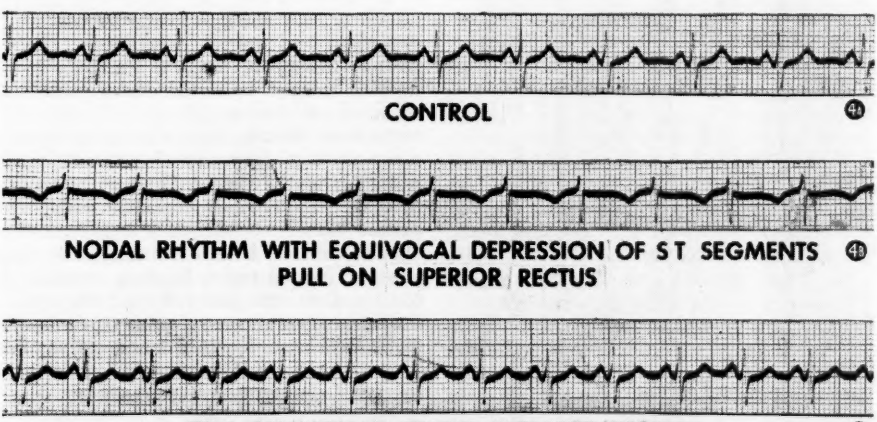
Fig. 4 was obtained under local anaesthesia.

Fig. 5 shows the occurrence of AV dissociation with synchronization.

This occurred during cataract extraction under general anaesthesia with retrobulbar injection.

DISCUSSION

Eyeball compression may influence the cardiac rhythm by way of the oculo-cardiac reflex (Ashner and Dagnini). The afferent arc for this reflex is the trigeminal nerve which, when stimulated by eyeball compression or operative procedures to the eye, causes increased vagal tone. This inhibits the heart, resulting in a variable degree of sinus depression followed by



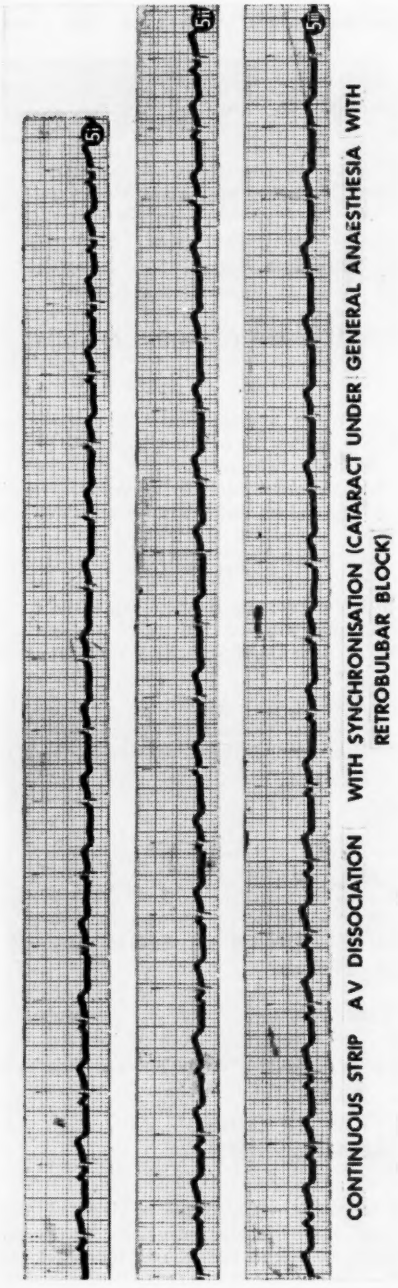
CONTROL

NODAL RHYTHM WITH EQUIVOCAL DEPRESSION OF S T SEGMENTS
PULL ON SUPERIOR RECTUS

PULL ON MEDIAL RECTUS WITH NO CHANGE
STRABISMUS UNDER LOCAL ANAESTHESIA

return to normal rhythm, transient nodal or ventricular escape, auriculo-ventricular dissociation or ectopic beats. The possible changes resultant on eyeball compression were recently reviewed by Schamroth[6] who reported the following changes:

1. Sinus depression.
2. Shift in the site of the primary pacemaker.
3. Auriculo-ventricular dissociation.
4. Precipitation of ventricular ectopic beats with fixed coupling.
5. Abolition of coupled ventricular ectopic beats.
6. Transient lengthening of the coupling interval with intermittent parasystole.
7. Variation in the duration of the PR intervals.
8. Prolonged PR intervals and higher degrees of auriculo-ventricular block.
9. Transient auricular and ventricular tachycardia.
10. Nodal and ventricular escape.
11. No change.



CONTINUOUS STRIP A V DISSOCIATION WITH SYNCHRONISATION (CATARACT UNDER GENERAL ANAESTHESIA WITH RETROBULBAR BLOCK)

To some extent these changes were duplicated during the course of the ocular operations. It is of interest to note that although the use of retrobulbar anaesthesia is reported to have diminished the incidence of ectopic rhythms, in 2 of the cases in the present series the use of this procedure did not prevent changes in rhythm.

In these 2 instances the changes seen were:

(*a*) AV dissociation with synchronization bradycardia and nodal rhythm.
(*b*) Ventricular ectopic beats.

This indicates that the use of retrobulbar block does not abolish the oculo-cardiac reflex in all cases. Kirsh *et al.*[3] found in their study that in all cases retrobulbar block prevented the oculo-cardiac reflex, while Bosomworth *et al.*[4] observed that only intravenous Atropine inhibited this reflex. Rhode *et al.*,[7] in 14 operations and animal experiments, came to the conclusion that cardiac arrest during operations is caused by accidents of anaesthesia (anoxia) and that surgical manoeuvres on the extra-ocular muscles are not sufficient by themselves to cause deep alterations in the physiopathology of the heart. The present series of investigations tends to indicate that the oculo-cardiac reflex is not abolished in all cases where retrobulbar block is used, including those operations performed under local anaesthesia. One can conclude that this reflex occurs regularly during the usual eye operations carried out under local anaesthesia. For this reason, doubt is cast on the significance of the oculo-cardiac reflex in relationship to cardiac arrest.

CONCLUSIONS

The oculo-cardiac reflex is initiated by pressure on the eyeball and by various manoeuvres attendant upon ocular surgery. In our series a number of patients showed changes in the primary pacemaker and these were regarded as

insignificant. Some patients showed significant electrocardiographic changes irrespective of the type of anaesthetic, whether local, general or combined. This should lead us to re-evaluate our opinion of the dangers of cardiac arrest, whether under local or general anaesthesia, as it seems that the same dangers are present, in otherwise healthy patients, under all types of anaesthesia (if there is in fact, a danger of cardiac arrest during eye surgery). We have noted no cases of cardiac arrest in this series.

We wish to thank the Superintendent of Baragwanath Hospital for his help and encouragement in pursuing this study; Dr. V. Wilson for making available the apparatus and staff; Drs. Levy, Chouler and Gelman for technical help and Dr. L. Schamroth and Dr. H. D. Jacobs for their critical comments on the electrocardiograms.

REFERENCES

1. Aschner, B. (1908): Wien. Klin. Wchnschr., **21,** 1529.
2. Dagnini, G. (1908): Boll. Sci. Med., **8,** 380.
3. Kirsh, Kugel and Axelrod (1957): AMA Arch. Ophthalmol., **58,** 348.
4. Bosomworth, Ziegler and Jacoby (1958): Anaesthesiol., **19,** 7.
5. Vail, D. (1958–1959): *Year Book of Ophthalmology,* pp. 301-302, Chicago: Year Book Publishers, Inc.
6. Schamroth, L. (1958): Amer. J. Cardiol., **2,** 321.
7. Rhode, Grom, Bajores, Anselmie, Capriles and Rivas (1958): Amer. J. Ophthalmol., **46,** 367.

GENERAL ANAESTHESIA FOR INTRA-OCULAR SURGERY

H. GINSBERG, M.B., B.CH., D.A., R. TROPE, M.B., B.CH., D.O.M.S.

and

J. R. DUFFIELD, M.B., B.CHIR., D.A.,

Baragwanath Hospital, Johannesburg and the University of the Witwatersrand, Johannesburg

For many years it has been customary to perform most eye operations, especially intra-ocular ones, under local anaesthesia except in the case of children, who for obvious reasons are almost invariably given a general anaesthetic.

In the days of ether and chloroform anaesthesia there may have been a great deal of justification for this, but with the advent of modern anaesthesia one wonders whether many of the reasons advanced for performing intra-ocular operations under local analgesia can still be considered valid. Certainly from the patient's point of view it is very much pleasanter to have an injection of thiopentone and fall into a peaceful sleep than to lie quietly on the table, afraid to move, while a local analgesic is given and the eye operated upon. From the surgeon's point of view, also, there is considerably less stress if he knows that the patient is unconscious and is not liable to squeeze or strain at the vital moment when the intra-ocular part of the operation is begun. He can give his undivided attention to the operation, knowing that the patient is being cared for by the anaesthetist.

Furthermore, with the patient asleep the surgeon does not need to hurry and can insert many more stitches, thus enabling early post-operative rising—a matter of some importance in old people.

What, then, are the objections to general anaesthesia in eye surgery and how, if at all, can these be overcome?

It has been said that under general anaesthesia "the mortality in ophthalmic surgery is probably greater than most of us realize' and that 'the rate of mortality in children is almost unbearably great.'[1] Yet Thomas *et al.*[2] describe 7,850 thiopentone administrations for eye operations without any untoward effect. At Baragwanath Hospital, during the 2-year period August 1957 to August 1959, we administered 285 anaesthetics for eye operations with no mortality or morbidity. Of these the youngest was 2 months old and the oldest 100 years. During some of these operations we have done ECG's and have failed to reproduce Kirsch's findings[3] that retrobulbar injections of procaine blocked the oculo-vagal reflex and thus prevented bradycardia and cardiac arrest during manipulation of the extra-ocular muscles. In fact, doubt has been cast on the significance of the oculo-vagal reflex in relation to cardiac arrest. It would appear that the frequency of occurrence of these reflexes is the same under local as under general anaesthesia.[4] It seems, therefore, that the danger of

general anaesthesia for eye surgery is no greater than it is for any other kind of surgery, i.e. in skilled hands it should be minimal for good-risk patients.

There are, of course, other objections to general anaesthesia for intra-ocular surgery, viz. the danger of coughing and straining during the operation and post-operative vomiting, which might result in loss of vitreous.

With these dangers in mind we have tried to develop a technique of anaesthesia which would be safe and pleasant for the patient and lead to minimal post-operative restlessness, nausea and vomiting.

At first we thought that hydroxydione (Viadril) might be the answer, combined with retrobulbar block, with the idea that the patient would be virtually undergoing the operation under local anaesthesia while asleep. Our technique was to induce the patient with 0.3% solution of hydroxydione until he was deep enough for the insertion of an oro-pharyngeal airway. Oxygen was then led down the airway and the drip was slowed to about 30 per minute, local anaesthesia was given and the operation proceeded with in the usual way. Fourteen intra-ocular operations were performed by this method, the youngest patient being 14 years old and the oldest 65, the average age being 41. The average dose of hydroxydione required per operation was 1,110 mg. On the whole this method was fairly satisfactory. Operating conditions were good and the patient had a pleasant, easy sleep with no post-operative nausea or vomiting. There were, however, certain disadvantages in the technique.

1. It was time-consuming.
2. Relatively large amounts of intravenous fluids had to be given.
3. There was no satisfactory control of the airway by the anaesthetist.
4. There could be no absolute certainty that the patient would not cough at the vital moment. One patient did, in fact, have hiccoughs for about 5 minutes during the operation.
5. There was always a considerable drop in blood pressure. In two cases this was as much as 100 mm. Hg systolic, while the average drop was 60 mm. This drop responded well to methyl amphetamine but in most cases the blood pressure did not reach pre-operative levels.
6. About half the patients were very restless post-operatively.

(The first two disadvantages could be overcome by giving more concentrated doses by direct intravenous injection).

We performed 4 cataract extractions under local anaesthesia and small doses of tubarine as advocated by Kirby,[5] Farquarson[6] and Henderson.[7] The results were quite satisfactory but we abandoned this method because:

1. From the patient's point of view, it was no pleasanter than a local anaesthetic; and
2. We felt that the anaesthetist did not have adequate control.

We therefore decided to try a simple technique of thiopentone and succinylcholine induction, followed by intubation and controlled respiration with nitrous oxide, oxygen and tubarine. In our hands this has proved most satisfactory, provided attention is paid to the following details:

1. The throat should be well sprayed with 4% Lignocaine before intubation.
2. Post-operatively the tube should be removed and adequate pharyngeal and tracheal toilet carried out before the relaxant is reversed, so as to avoid straining round the tube and coughing due to mucus in the pharynx.

This technique has the advantage that the patient has a pleasant induction and minimal post-operative nausea and vomiting. Most patients wake up as from a normal sleep and are not restless or violent. The anaesthetist has full control of the airway throughout the operation and the surgeon has ample time to place as many sutures as he pleases without fear of straining or coughing at the psychological moment.

We have performed 50 cataract extractions by this technique with no anaesthetic complications. Of the 68 cases (14 hydroxydione, 4 tubarine and local anaesthesia and 50 thiopentone and relaxant) done by the 3 afore-mentioned techniques, vitreous loss occurred in 3 (4.4%) as against vitreous loss in 19 of 142 (13.4%) cataracts done under local anaesthesia. Although the number of cases done is small, it would appear that there is less danger of vitreous loss under general than under local anaesthesia, even admitting that the non-European, owing to language difficulties, is less co-operative than the European and more likely to squeeze while conscious. The overall incidence of vitreous loss would seem very high but can, in part at any rate, be accounted for by the fact that these operations were performed by staff of all degrees of experience and inexperience.

It is not claimed that the use of thiopentone in combination with nitrous oxide and muscle relaxants in the only method of anaesthesia. Some anaesthetists have found halothane (Fluothane) very satisfactory. In the few cases done by this method our results have been

good, but we feel that the control of the anaesthetist is not as perfect as it is with controlled respiration; there is always a danger that the patient may strain round the tube and there is a somewhat higher incidence of post-operative vomiting.

DISCUSSION

In our experience, general anaesthesia for ophthalmic surgery has certain advantages over local anaesthesia in that:

1. It is pleasanter for the patient.
2. It is easier for the surgeon, so much so that in difficult patients it is now standard routine at our Hospital to do these cases under general anaesthesia.
3. There are fewer ophthalmic complications.
4. Because of more meticulous suturing, it is possible for the patient to rise earlier. The latter two are of vital importance and must swing the balance in favour of general over local anaesthesia.

It is our conviction that in skilled hands the danger to the patient is no greater under general than under local anaesthesia, especially as oculo-vagal reflexes are *not* always abolished by retro-bulbar injection.

The method of anaesthesia must be largely a matter of individual choice, but the technique described here has, in our hands, fulfilled all the necessary requirements for general anaesthesia for intra-ocular surgery.

SUMMARY

1. The advantages of general over local anaesthesia for ophthalmic surgery are discussed.
2. Various techniques of general anaesthesia are described.
3. In the authors' hands a combination of thiopentone with relaxants and controlled respiration with nitrous oxide and oxygen gave satisfactory results.

REFERENCES

1. Gartner, S. and Billet, E. (1958): Amer. J. Ophth., **45**, 847.
2. Thomas, G. T. and McCaslim, M. F. (1955): Curr. Res. Anaes. Analg., **33**, 333.
3. Kirsch, R. E., Samet, P., Kugel, V. and Axelrod, S. (1957): Arch. Ophth., **58**, 348.
4. Trope, R. and Rosenzweig, D. (1959): Med. Proc., this issue p. 40.
5. Kirby, D. B. (1951): Brit. Med. Assoc. Acta, **2**, 1094.
6. Farquarson (1951): Amer. J. Ophth., **34**, 554.
7. Henderson. J. W. (1953): Amer. J. Ophth., **36**, 781.

AN APPROACH TO STAB WOUNDS OF THE NECK

J. W. PONT, M.B., CH.B. (PRET.), F.R.C.S. (ED.)
Department of Surgery, Baragwanath Hospital, Johannesburg

Stab wounds of the neck can be among the most difficult emergencies to confront the surgeon. Because of this, a survey was made of a 104 of these patients admitted to Baragwanath Hospital during a 20-month period. The type of injury was analysed and a scheme of treatment proposed. Most were healthy young adults who had sustained these injuries during fighting and had been stabbed with knives, screwdrivers, sharpened bicycle spokes and bottle fragments. Fifty-seven per cent of the wounds were situated in the left antero-lateral part of the neck; 35% in the right antero-lateral part and only 9% posteriorly; 41% had multiple wounds. As an added hazard, most victims were intoxicated.

The external aspect of a neck wound is notoriously misleading, and it is only with adequate exploration that its full extent and severity can be determined. In this series, 70% of patients had obvious superficial or well-defined injuries that could be assessed by exploration in Casualty, but all others were submitted to surgery in the theatre.

The time from sustaining the injury to admission to hospital averaged 9 hours. Exclusion of cases brought in after 24 hours reduced this time to 4½ hours.

TREATMENT

I. FIRST-AID MEASURES

These were initiated in Casualty and, when the patients' condition warranted transfer, continued in the ward.

1. *Arrest of Haemorrhage.* Haemorrhage may be arterial, venous or both, and controlled by one of the following measures:

(*a*) *Direct Pressure on or in the Wound*

i. Digital pressure.
ii. Packing the wound.
iii. Pressure dressings on the wound, but avoiding compression of the airways.

(*b*) *Ligation of the Severed Vessel.* This was only done where the vessel could be clearly visualized. The danger of plunging an artery forceps in a pool of blood must be stressed.

(*c*) *Compression of the Common Carotid Artery on the Affected Side.* This only decreases the arterial bleeding, but is useful until other measures can be applied. Faraboeuf's manoeuvre,[1] i.e. pinching of the common carotid between forefinger and thumb, was not utilized in any case.

(*d*) *Suturing of the Skin Edges of the Wound, to Allow a Haematoma to Develop.* This procedure is only of value in venous bleeding, and then only when lesser vessels are transected. A big haematoma undoubtedly makes the subsequent exploration more difficult.

Immediate enlargement of the wound to expose the bleeder, and dealing with it under direct vision, are absolutely essential where the aforementioned measures fail. This can be done under a local anaesthetic, or even without any anaesthetic, as was found necessary in 4 cases where massive arterial haemorrhage proved uncontrollable in the ward during resuscitation.

2. *Maintenance of a Clear Airway.* Respiratory obstruction can be due to:

(*a*) Pressure of a haematoma.
(*b*) Surgical emphysema.
(*c*) Damage to the pharynx, larynx and trachea.

The first aid measures comprise:

(*a*) Clearing the mouth and the trachea of blood by suction.
(*b*) Tracheotomy under local anaesthesia.
(*c*) Intubation under local anaesthesia.

3. *Control of Shock.* This is oligaemic shock due to blood loss and this loss must be assessed so that an adequate amount can be replaced.

(*a*) *Assessment of Blood Loss*:

i. *Clinically.* When there is rapid blood loss, changes occur in the circulation which cause easily recognizable signs. There is first a vaso-constriction which results in pallor and coldness of the skin. Pallor is best appreciated in the face, and coldness in the extremities. At the same time, the pulse rate increases. Later the blood pressure falls and ultimately cannot be measured. The general signs appear, viz. restlessness, dyspnoea, sweating, thirst, nausea and vomiting. Until the blood pressure is greatly reduced the patient remains mentally clear, usually alert and apprehensive.[2]

Among the clinical features, the level of the systolic blood pressure is the best index of the blood volume,[3] though it is not entirely reliable. The figure of 100 mm. Hg can be taken as the critical level, below which urgent treatment becomes obligatory,[4] and then the loss is taken to be more than 2½ pints of blood.

The Blood Pressure and Blood Volume.[4] This is reflected in Table 1.

It must be emphasized that in the immediate post-traumatic phase the blood pressure may be normal or it may even rise a little, due to vaso-constriction, with the pulse rate normal or slow. With the blood volume reduced below 80%, the condition is usually transient and may be succeeded by a profound fall in blood pressure.[2] Post-traumatic hypertension is not uncommonly seen in children. The hypertensive patient may be difficult to assess.

ii. *Evaluation from the Extent of the Local Injury*:

(*a*) *External Loss.* The amount of blood on the clothes and dressings may give an indication of loss.

(*b*) *Haematoma and Tissue Injury.* The method of Grant and Reeve is used. In superficial injuries, the wound is compared with an open hand; in deep and lacerated wounds, with a fist. The hand indicates loss of half a litre of blood.

iii. *Evaluation from Changes in the Composition of Blood.* When blood is lost by an acute haemorrhage, transfer of interstitial fluid restores the blood volume in 36 hours, but the normal haemoglobin content is not restored for some weeks. However, the haemoglobin or haematocrit readings immediately after injury do not accurately indicate the blood loss, but as a guide it can be taken that if the haemoglobin is above 90% 12 hours after injury, the previous blood loss is less than 40%; a haemoglobin estimate of less than 75% indicates a blood loss of more than 40%.[2]

II. TREATMENT OF SHOCK

Generally, after a wound is inflicted about half the total blood loss will occur in the subsequent 3 hours, but massive quantities may be lost in a matter of minutes when a major vessel is severed.[6]

i. *Transfusion.* The transfusion should consist of cross-matched whole blood. While cross-matching is being done, plasma may be transfused and in urgent cases; low-titre group

TABLE 1

Blood Pressure (mm. Hg.)	*Blood Volume*
>140	>80%
100—140	70—80%
70—100	60—70%
<70	<60%

O blood should be used. Where blood loss does not exceed one litre, plasma alone should suffice.[7] When large quantities of blood are lost, not more than one part plasma to three parts of blood should be used.[3]

ii. *Rate of Transfusion.* The immediate object is to get the blood pressure up to 100 mm. Hg; thus *energetic* transfusion is imperative.[5] In badly shocked patients, the first few pints are pumped in under pressure, and as much as 2 litres can be given in the first half hour. Several simultaneous intravenous drips were used on a few occasions.

Intra-arterial transfusions were not given, because of the advice that they were no more effective than the intravenous method and may be fraught with danger.[8, 9]

iii. *Amount Transfused.* Once the blood pressure has reached 100 mm. Hg, 2 more pints of blood are required, even when there is no further loss.[3] Allowance must be made for haemorrhage during exploration and the patient must go to theatre with an adequate amount of cross-matched blood.

In this series, 20% of the patients needed transfusions, the amounts varying from 500-7,000 c.c. blood. Most patients were submitted to definitive exploration only after the blood pressure had been restored to 100 mm. Hg, but in a few (where the bleeding could not be controlled at all) surgery was undertaken as soon as possible.

Where massive transfusions were given, 0.5 g. calcium gluconate per pint of blood was given intravenously to prevent citrate poisoning.

Pre-operative Measures: (*a*) *Relief of Pain.* Morphine or pethidine was used when indicated, intravenously in the shocked patients.

(*b*) *Emptying of the Stomach.* This was done as a routine on all drunk patients and where food had been taken less than 6 hours before admission.

(*c*) A.T.S. 1500 units, after a sensitivity test, and antibiotics were given routinely, a penicillin and streptomycin combination mostly being used.

III. ANAESTHESIA

Premedication consisted of atropine 1/100 gr. Analgesics were given when necessary, but withheld in the very drunk patient.

Local anaesthesia was used in 26% of the patients. The 74% that received a general anaesthetic were all intubated. Here again the importance of adequate pre-operative blood replacement must be stressed. If this is not done, irreversible circulatory failure may follow the induction of anaesthesia, because of the elimination of the compensatory mechanism of peripheral vasoconstriction.[10]

IV. EXPLORATION OF THE WOUND

Again it is felt necessary to emphasize the importance of early exploration of these misleading wounds. The dangers of 'watchful expectancy' are:

(*a*) *Reactionary Bleeding*: When the blood pressure is brought back to normal and maintained at a normal level.

(*b*) *Infection*: Large haematomata are very susceptible to infection and a secondary infection is an added danger. Local wound infection was found in 5% of our patients and of these only one had been explored. Secondary haemorrhage was fortunately not seen.

(*c*) *Late Complications*:

i. *Aneurysm Formation.* Due to the difficulties of adequate follow-up studies, the exact percentage of patients who developed traumatic aneurysms could not be determined. However, 2 patients developed aneurysms while still in hospital, neither of whom had been explored on admission.

ii. *Arterio-Venous Fistula Formation.* This was not seen in this series.

(*d*) *Technical Difficulties.* Exploration was very much more difficult in cases where it was delayed because of the diffuse infiltration of the haematoma in all fascial planes and muscles of the neck and fairly early granulation tissue formation.

CASE REPORT 1

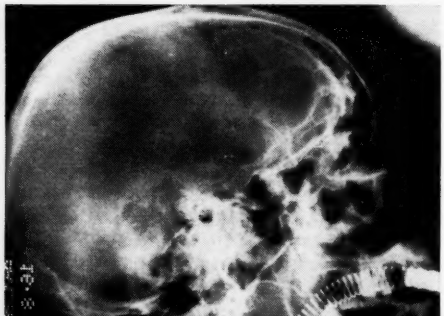
A. L., a young adult male, was admitted to hospital 4 hours after being stabbed in the neck. He had bled profusely and was severely shocked. After adequate resuscitation, the wound was explored under general anaesthesia. The stab extended from the midpoint of the posterior border of left sterno-mastoid, postero-laterally to the internal jugular vein as far as the transverse process of C5. No major severed vessels could be found and the wound was closed in layers. Twelve hours later the patient had a massive arterial haemorrhage from the wound and expired. At autopsy it was found that the vertebral artery had been severed between the transverse processes of C4 and C5.

This is a typical example of reactionary bleeding following inadequate exploration.

CASE REPORT 2

T. H., a young adult male, was admitted to hospital in a comatose condition, smelling strongly of beer. The blood pressure was 115/65 mm. Hg, pulse rate 120 per minute and he had a right-sided hemiparesis. The stab wound was over the middle of the left sterno-mastoid muscle

He was not explored. Conciousness gradually returned during the following days, but he remained hemi-paretic and was aphasic as well. A month later an angiogram demonstrated an eneurym of the common carotid artery on the left (Fig. 1). This was then explored and evidence of partial severance of the artery found. The aneurysm was ligated proximally and distally. The hemi-paresis gradually improved and some speech returned.



Early exploration and suture of the artery would undoubtedly have prevented the aneurysm formation, though it is doubtful wheher the end result would have been better.

V. EXPOSURE

Wide exposure is absolutely necessary. Foille and Delmas[11] were among the first to stress this principle in vascular surgery and many[12, 13] have since then emphasized this point. In the neck, with its numerous important structures lying in close and intricate relation to one another, this principle is doubly important.

The incision used for wounds in the anterior triangles and over the sterno-mastoid itself, is a long incision along the anterior border of the sterno-mastoid. The exposure can be increased by angling the incision posteriorly along the upper border of the clavicle and dividing the insertion of sterno-mastoid and transecting the omo-hyoid. Virtually all vital structures are exposed this way.[14, 15] Wounds of the posterior triangle are exposed by an incision along the posterior border of the sterno-mastoid, and the same type of supraclavicular incision can be added.

Supraclavicular stabs often penetrate into superior mediastinum and here Duval's sternum-splitting osteoplastic flap procedure is of great value.[13]

CASE REPORT 3

A. M., a 56-year-old patient, was admitted to hospital 45 minutes after being stabbed over the lower third of the right sterno-mastoid muscle. He was severely shocked and was taken to the theatre after adequate resuscitation. An incision was made along the anterior border of right sterno-mastoid and angled laterally along the upper border of the clavicle. The sterno-mastoid was transected at its insertion and retracted superiorly. It was then apparent that the bleeding was coming from the superior mediastinum. The sternum was then split as far as the angle of Louis, the clavicle, 1st and 2nd ribs were cut in mid-clavicular line and this bony flap was then hinged laterally. The subclavian artery was fully exposed, found to be transected and doubly ligated. The bony flap was anchored with wire and the wound closed. The patient made a complete recovery.

VI. INJURIES

1. *Superficial Wounds.* Debridement of the wound is performed and the wound sutured. Special attention should be paid to careful approximation of the platysma, to avoid an adherent scar or wide scar formation.[14] When there is danger of infection, as with concomitant wounds of the oesophagus, the wound must be left open to allow adequate drainage. Closure may be done 5 days later, but it is amazing with how little scarring wounds in the neck do granulate and it is, therefore, rarely necessary to do a secondary suture.

2. *Vascular Injuries.*

(*a*) *Veins*: Sixteen patients had venous trauma and 11 of these had proven injuries of the external jugular vein. The incidence of this injury is probably much higher in this series, as there were a considerable number of 'haematomata on the lateral aspect of the sterno-mastoid' which were not explored and thus not classified.

There were 4 cases of injury to the internal jugular vein and one case where the right innominate vein was cut. In all these cases the veins were doubly ligated with no untoward effect. Ligation of the superior vena cava is the only one to be avoided and repair should be attempted in all these injuries.[13]

Laceration of the internal jugular vein at the base of the skull can be very difficult, or impossible, to control with suture or ligature. Leaving a haemostat on the vessel for a few days,[15] or packing the wound firmly with gauze that is left *in situ* for days or weeks, as neces-

sary, is the best treatment. In one case, where the vertebral vein was cut in the foramen transversarium of C7, haemorrhage was controlled by packing haemostatic ribbon into the foramen.

(*b*) *Arteries*: Ten patients were admitted with injuries involving the carotid arteries. Four of these died shortly after admission. Four patients presented with hemiplegia and of these, 3 were submitted to exploration after resuscitation. In all of them the common carotid arteries as well as the internal jugular veins were found to be transected and the vessels were doubly ligated. Two of these died within 24 hours after the operation; the third recovered but had a permanent hemiparesis.

Two patients were not explored and developed traumatic aneuryms of the common carotid subsequently, the first one (Case 2) one month after admission and the second one 3 weeks later. The latter was also explored and an obliterative endo-aneurysmorrhaphy was performed, with complete recovery.

Thus five of the 6 patients who survived the initial trauma had a hemiparesis, and all of those that had a complete transection of the common carotid had a hemiparesis. This compares very unfavourably with cases where ligation of the common carotid is done as a definitive procedure. Lipshitz[16] found a morbidity of 10–15% at Baragwanath Hospital in cases where the common carotid was tied after the most careful pre-operative studies had been made. It must therefore be concluded that the high incidence of hemiparesis in trauma of the common carotid is due to the concomitant shock.

No injuries of the internal carotid were found, but as ligation of this vessel is fraught with even greater danger than that of the common carotid, the incidence of hemiparesis after trauma must be very high as well. Triple ligation of the bifurcation is also a dangerous procedure. Thus repair of the carotids, where feasible, should certainly be attempted.

The external carotid artery and its branches can be tied with impunity.

Angiograms, though so far rarely used in these cases, will undoubtedly be of great value in assessing the site of injury.

Arterial grafts were not utilized in any of our patients, as the indications did not exist, but they may be valuable in the selected case.

3. *Injuries of the Larynx and Trachea.* Nine cases with injuries of the larynx and trachea were found. In 6 of these it was an isolated injury of the trachea, presenting only with superficial emphysema around a small midline wound. None had dyspnoea, and treatment consisted of debridement of the wound and suture of the skin. All made an uneventful recovery. Lichtenstein[15] also advises that larger tracheal wounds tend to close, or may be closed by suture of the overlying fascia, muscle or adjacent thyroid tissue. These lacerations can be closed by direct suture as well.

The greatest danger to the patient is found when there is a concomitant vessel injury, with bleeding down the trachea. In these cases it is imperative to do a tracheotomy under local anaesthesia and introduce a cuffed tracheotomy tube. The respiratory passages are then sucked clear of blood and further exploration of the wound undertaken, preferably under local anaesthesia.

Oesophageal or pharyngeal injuries must always be suspected when the trachea is involved and these structures must be carefully examined.

CASE REPORT 4

D. L., an adult male, was admitted to hospital an unknown time after receiving a stab to the right of the larynx. He was severely shocked, dyspnoeic and slightly cyanotic. Around the wound there was surgical emphysema and a large haematoma, and a little blood was oozing from his mouth.

After resuscitation the patient was taken to the theatre and after Pentothal and Scoline injections, an endotracheal tube was passed, blood was sucked from the trachea and bronchi and then an attempt was made to insufflate the lungs. The patient immediately became extremely cyanotic as the blood was forced into the alveoli and cardiac arrest took place. All attempts at resuscitation were fruitless. Exploration demonstrated that the stab had severed the internal jugular vein and had then penetrated the larynx.

This case illustrates the importance of following the procedure advised.

4. *Lung Injuries.* It is an excellent reminder to the surgeon that the apex of the lung is a cervical structure, when we find 16 cases of penetration wounds of the lung in this series. Ten cases had only surgical emphysema in the supraclavicular area, 3 had a pneumothorax and 3 had haemo-pneumothoraces. Closure of the pleural defect is, as a rule, impossible and unnecessary and airtight closure of the skin wound is sufficient. The haemo- and the pneumo-thorax are treated conservatively as a rule, but this aspect will not be discussed here.

5. *Injuries of the Pharynx and Oesophagus.* Three cases of penetrating wounds in the pharynx were found. Two of these injuries were extensive and suture of the lacerated wall was performed. In the third patient it was only a prick wound which was not sutured. All the wounds were drained and only one

developed an infection. This cleared up with conservative treatment. Drainage is, of course, imperative, because of the danger of mediastinitis.

One oesophageal wound was found, amazingly enough as an isolated injury after a stab wound in the left side of the neck. The patient was admitted 6 days after the injury and the wound was septic. A barium swallow demonstrated the leak. The wound was then explored, the oesophagus sutured and the wound drained. The patient made a good recovery.

Swartz[18] advises that endoscopy should be performed on all cases with neck wounds. A probe is passed through the neck wound and penetration of the pharynx, oesophagus and trachea should be recognized at once. This procedure was followed in a few cases where these injuries were suspected; it is of undoubted value.

Post-operatively it is advised that the patient be fed through a Ryle's tube;[17] or a gastrostomy should be done in extensive injuries of pharynx and larynx.

6. *Cord and Nerve Injuries*:

Spinal Cord. Two patients who were stabbed posteriorly in the midline of the neck presented with Brown-Sequard syndromes. Neither was shocked, there were no signs of blood loss and treatment consisted of antibiotic administration, physiotherapy, etc. Both remained in hospital for many months, but showed only slight improvement from the initial presentation. One patient, who was stabbed in the left supraclavicular area, presented as a partial cordotomy, viz. anaesthesia of the arm with normal motor function.

Brachial Plexus. Three patients had root lesions of the brachial plexus, viz. two at C5–6, and one at C5, 6, 7, 8.

No attempts were made to restore the continuity of the nerves and after a period orthopaedic measures were undertaken to improve function of the arm.

Sympathetic Chain. In 2 cases, Horner's syndrome was found as a concomitant injury. Unfortunately no long follow-up records are available to see whether these were permanent injuries.

Cutaneous Nerve Injuries. Small areas of hypo-aesthesia were recorded in 4 cases.

7. *Thoracic Duct Injury.* One case of primary thoracic duct injury was found. The stab had penetrated the pleural cavity as well and a chylothorax was present. The duct was ligated and the chylothorax aspirated. In one case the duct was injured during exploration and ligated.

MORTALITY

The mortality rate was 77%. All the patients who died had injuries of the greater vessels. Six had injuries of the common carotid arteries and 4 of these died shortly after admission. The other 2 died within 24 hours after exploration. One patient (Case 1) died of reactionary haemorrhage from a transected vertebral artery that had been missed at exploration. The last patient had combined internal jugular vein and laryngeal injuries (Case 4).

Vandenbos[20] gives the overall mortality from neck wounds during World War II and from civilian case reports as 7–11% of wounds treated within 6–8 hours and as 25% when treated after 8 hours. Lewis[19] found that mortality rates of patients with neck wounds during the Middle East campaign varied from 2.6–6.2%.

CONCLUSIONS

1. A series of 104 stab wounds of the neck is analysed.

2. Thirty per cent. of the wounds were deep and warranted exploration.

3. The mortality rate was 7.7% and all these patients had injuries of the major vessels.

4. The following principles are laid down for the effective treatment of stab wounds of the neck:

(*a*) Early admission to hospital.
(*b*) First-aid control of haemorrhage.
(*c*) Maintenance of a clear airway.
(*d*) Immediate and adequate treatment of shock.
(*e*) Early exploration of the wound. This is especially important in vascular and suspected vascular injuries.

I wish to express my gratitude to Dr. I. Frack, Medical Superintendent of Baragwanath Hospital, for his permission to submit the cases for publication, and to Mr. S. Kleinot, Senior Surgeon, for helpful criticism.

REFERENCES

1. Bailey, Hamilton (1941): *Surgery of Modern Warfare,* p. 670. Edinburgh: E. and S. Livingstone.
2. Wound Shock Working Party (1957): *The Treatment of Wound Shock,* M.R.C. (Lond.) Mem. No. 34.
3. Grant, P. T. and Reeve, E. B. (1951): Spec. Rep. Ser. M.R.C. (Lond.), No. 277.
4. Louw, J. H. (1958): S. Afr. Med. J., **32,** 339.
5. Clarke, A. R. (1957): Brit. Med. J., **2,** 721.
6. Clarke, A. R. and Fisher, M. R. (1956): Brit. J. Clin. Pract., **10,** 746.

7. Ogilvie, H. (1955): Brit. Med. J., **1**, 159.
8. Case, R. B., Sarnoff, S. J. and Waithe, P. E. (1953): J. Amer. Med. Assoc., **152**, 208.
9. Melrose, D. G. and Wilson, A. O. (1953): Lancet, **1**, 1266.
10. Dudley, H. A. F. (1957): J. Roy. Coll. Surg. Edin., **2**, 202.
11. Foille and Delmas (1921): *Surgical Exposure of the Deep-Seated Blood Vessels* (Translated) London: Heinemann & Co.
12. Henry, A. K. (1945): *Extensile Exposure in Limb Surgery*, Edinburgh: E. & S. Livingstone, Ltd.
13. Buckner, F. *et al.* (1958): Surg. Gynecol. Obstet., **107**, 135.
14. Kinsella, T. J. (1941): Minnesota Med., **24**, 942.
15. Lichtenstein, M. E. (1947): Surg. Gynecol. Obstet., **85**, 734.
16. Lipshitz, R. (1958): *Personal communisation.*
17. Wiser, J. H. *et al.* (1946): Naval Medical Bull., **46**, 57.
18. Swartz, M. (1949): Ann. Otol. Laryngol., **3**, 892.
19. Lewis, R. S. (1944): Lancet, **1**, 781.
20. Vandenbos, K. Q. (1953): A.M.A. Arch. Surg., **75**, 721.

SOME ASPECTS OF HYDATIDIFORM MOLE AND ECTOPIC TROPHOBLASTIC TISSUE

WITH A CASE REPORT

L. J. SCHEWITZ, M.B., B.CH., DIP. O. AND G. (RAND) *

Baragwanath Hospital and the University of the Witwatersrand, Johannesburg

Hippocrates (4th to 5th century, B.C.)[16] refers to dropsy of the uterus, which may be considered the earliest recorded mention of hydatidiform mole. Some 900 years later, Aetius of Amida[1] (6th century, A.D.) is found to make reference to 'small, bladder-like objects' in the uterus, and since this time speculation concerning the pathogenesis, pathology and treatment of this condition has continued.

A survey of the literature for examples of secondary deposits of chorionic tissue in cases with hydatidiform mole has met with difficulty for the reason that, although great strides in knowledge have been made, the subject is bedevilled by confusion in terminology and a lack of precise understanding of the processes of normal and abnormal growth of the chorion.

PATHOLOGY, PATHOGENESIS AND INCIDENCE OF HYDATIDIFORM MOLE

Marchand (1898)[20] first advanced the theory of the foetal origin of hydatidiform mole and this is still the accepted view.

Recent work has shown that a significant proportion of pregnancies is blighted from the outset and abort early. From studies of these ova and the products of later abortion has arisen the concept of hydatidiform degeneration as a progression from near normality and minimal change to florid hydatidiform mole. The reported incidence of hydatidiform change varies enormously according to the criteria employed by various authors. Figures such as 1 in 2,334 pregnancies;[31] 1 in 250 pregnancies;[3] and 4% of all pregnancies,[14, 21] illustrate this variation.

Hertig and Edmonds[14] have found that pathologic ova constituted 47.4% of a series of 1,027 spontaneous abortions and, in these, the incidence of hydatidiform change was 66.9% as apposed to an incidence of 11.6% in 'nonpathologic' ova. They maintain that the change to hydatidiform characteristics is due to failure in the development of a foetal circulation while the chorionic epithelium maintains its early function of absorption of tissue fluids, which must then accumulate in the villous stroma. The syncytioblast, for the same reason, persists with its early function of proliferation and, often, invasion. This concept provides a largely satisfactory explanation of the pathological and clinical vagaries of the condition.

Further support for this concept is provided by Shippel's (1958) demonstrations[32] that the placentae of infants with disturbances of circulation or nutrition and oxygenation, such as those with hydrops foetalis or congenital cardiac anomalies, show a more primitive picture than would be expected judging by the menstrual age of the pregnancy.

The pathological picture of the undoubted case of hydatidiform mole shows villi in various stages of cystic enlargement. The stroma is found to contain few fibroblastic cells and advanced myxoid degeneration is seen.

*Assistant Obstetrician and Gynaecologist.

There are no or very few blood vessels present. The chorionic epithelium may be thin and atrophic, with only syncytium, or may show signs of very active proliferation with greatly increased cellularity.[3]

INVASION AND EMBOLIZATION

The student of the behaviour of normal and abnormal trophoblastic tissue is confronted with a number of peculiarities, both clinical and pathological, which have made this subject extraordinarily complex.

Normal chorionic epithelium possesses properties of histiolysis and invasion which it exerts in decreasing grades as pregnancy progresses. There is no doubt that cellular elements and whole villi are carried as emboli to the lungs and pelvic tissues in normal pregnancy and are there destroyed.[8, 30, 36] It will be noted that these properties (present under normal conditions) are those of many other forms of truly malignant tissue. This fact is the crux of the difficulty which arises when attempts are made to assess the malignant potentialities of trophoblastic tissue. An added difficulty in such studies is that malignant trophoblastic growth is unique in that it constitutes the only naturally occurring neoplasm which originates from cells other than those of the patient's body. These complexities have prompted a search for histological criteria of malignancy in chorionic growth, and have made necessary the consideration of host resistance to chorionic invasion.

In this light it may be worthwhile to consider what the term 'malignancy' denotes before indicating some of the opinions which have been expressed. To the pathologist, the term implies the anaplastic growth of abnormal cells which have the property of destructive invasion. Metastases of these cells occur in which the characteristics of the primary growth are maintained. To the clinician the term has a somewhat different connotation. Should he be the unfortunate observer of a disease process (not always neoplastic) which will kill his patient, he frequently designates the process as malignant.

When applied to the processes of chorionic growth, both uses of the term hold partially true. The so-called benign, secondary deposits of hydatidiform mole may cause death by haemorrhage from eroded blood vessels or by superimposed infection, but are known frequently to regress spontaneously. Chorionepithelioma, should essential viscera not be destroyed by direct destruction, may cause death in the same way and the metastases of chorionepithelioma have also been known, on rare occasions, to regress completely.[9]

One is forced to the conclusion, put forward in various ways by several authors, that the grades of malignancy of chorionic growth are not clearly divided but are seen as a progression through the different manifestations of the condition.[5, 9, 15, 26, 37]

In the present review only the more recent views of the distinguishing histological characteristics of malignancy in chorionic tissue are described.

The division of the choriomas into benign hydatidiform mole, invading hydatidiform mole (chorioadenoma destruens) and chorionepithelioma (chorio-carcinoma) is still widely accepted. Benign mole is believed to remain localized to the uterine cavity but this criterion is open to much doubt in view of the present knowledge that invasion of the uterus and many other tissues by chorionic epithelium occurs with great frequency, in forms often not clinically detected.

Hertig and Sheldon[15] have attempted an assessment of malignant characteristics on the basis of the degree of hyperplasia and anaplasia of the cellular elements of villous epithelium. Their view is given partial support by Nesbitt[24] who, however, does not believe it possible to determine the degree of cancer potentiality in moles by the histological appearance of evacuated molar tissue. The latter author claims that: 'The pathologic criteria for invasive mole are:

1. Abnormal penetrativeness into the uterine, parauterine and adjoining vaginal tissue which may be quite similar to those of frankly benign type; and
2. Abnormal degrees of trophoblastic proliferation.'

On the other hand, Willis[37] and Novak and Seah[26] agree that the cell characters of benign and malignant trophoblast are, in fact, identical in appearance. These, and many other authorities, place great reliance on the general architecture of the tumour growth, maintaining that the presence of much haemorrhage and necrosis of tissues with invasion by large sheets of trophoblastic cells are the main features indicating chorionepithelioma. A second criterion, also widely held to be of importance, is that formed villi are very rarely found in chorionepitheliomatous tissue. Where secondary deposits are found, these points of difference are clearly of great importance and, as the case reports show, assessment of these features often, but by no means always, will indicate prognosis in the individual case.

'BENIGN' INVASION AND EMBOLIZATION IN HYDATIDIFORM MOLE

Keeping in mind the generally accepted histological criteria for a diagnosis of benign invasion and embolization, a survey of the literature was made in order to bring together the reported cases of hydatidiform mole where such spread had occurred. Once again the difficulty of varying terminology was encountered, and it must be conceded that an accurate survey from the literature alone cannot, at present, be made.

Several cases have been reported under a diagnosis of chorionepithelioma where the secondary deposits have regressed spontaneously and the patients have remained well over prolonged periods. The suspicion is thereby aroused that such cases are wrongly classified and is strengthened by Novak and Seah's claim[26] that survey of the material of the Mathieu Memorial Chorionepithelioma Registry has disclosed a significant number of wrongly classified cases. On the other hand, the less common mistake of classifying cases as invasive mole where chorionepithelioma has been present and death has resulted from secondary deposits, is also believed to have occurred.

Realizing, therefore, the pitfalls inherent in the survey, 21 single case reports (where details were adequate and including 1 case seen at Baragwanath Hospital) are set out in Table 1 below. Various other reports of groups of such cases are quoted, together with extracts from more general surveys where single cases are briefly described.

CASE REPORT

M. M., an 18-year-old nulligravida, was admitted to Baragwanath Hospital on 29 April 1955 in a state of severe shock.

Clinical History. The last normal menstrual period had started on 28 February, 8½ weeks before admission, and she considered herself pregnant.

For 1 month she had had nausea and frequent vomiting and for 3¼ hours before admission she had been bleeding painlessly and profusely per vaginam. No other significant factors were elicited in the history.

Condition on Examination. She was in a state of severe haemorrhagic shock. A soft, cystic mass was felt in the hypogastrium arising from the pelvic cavity to the size of an 18 weeks pregnancy. It was mobile and non-tender. No foetus was felt within the mass.

Vaginal Examination. Just within the vaginal introitus, in the anterior midline, was a flat, purple nodule about ¾ inch in diameter. From an irregular, central tear, profuse bleeding was occurring. Three small, jelly-like vesicles were expressed from this nodule while it was being palpated.

The cervix was soft and mobile with the external os closed. The uterus was soft and was enlarged to the size of an 18 weeks' pregnancy. On speculum examination there was no bleeding through the cervix. There were no other abnormalities.

Emergency Treatment. The patient was given a massive blood transfusion and suturing of the vaginal nodule stemmed the haemorrhage. She responded rapidly to the usual resuscitative measures.

Pathological Report: (Dr. J. Higginson) Section of the vesicular structures from the vaginal nodule showed the typical histological features of the villi of a simple hydatidiform mole. Both syncytium and Langhans cells were present but there was no excessive cellular proliferation.

Further Investigations:

Xenopus (Frog) Pregnancy Tests were performed on 1, 3 and 9 May. The first test was positive with urine diluted twice, but the other 2 were positive only with undiluted urine.

Routine urinalysis was negative.

X-ray examination of the chest was normal. No foetus was seen within the mass on an X-ray film of the abdomen.

Treatment. Having made a diagnosis of hydatidiform mole, an abdominal hysterotomy was performed on 10 May and a hydatidiform mole was removed from the uterine cavity. Both ovaries were found to be enlarged to about 2½ times the normal size by numerous, thin-walled cysts. There was no evidence of other secondary deposits. Histological examination of the operative specimen showed benign hydatidiform mole.

Further Course. She underwent an essentially uneventful post-operative course and pregnancy tests on 18, 23, 25 May and 2 June were all negative.

Twenty days after the operation a small haemorrhage recurred from the site of the vaginal nodule.

A large biopsy was taken from this site and the features were those of a simple papilloma which was the seat of a non-specific, chronic, inflammatory reaction. No trophoblastic tissue was found.

Follow-up. The patient was followed for 7 months and remained healthy in all respects. Repeated Xenopus (frog) tests were negative.

Diagnosis. Hydatidiform mole with a benign secondary deposit in the vagina containing the formed villi of hydatidiform mole.

TABLE 1: CASES OF HYDATIDIFORM MOLE WITH SECONDARY DEPOSITS

Names of Authors	*Anatomical Position of Secondaries*	*Histological Picture in the Secondary Deposits*	*Treatment*	*Outcome (Where Known)*
1. Findley[10]	Vagina	Proliferating syncytial cells only.	Hysterectomy. (Nil in uterus).	Alive and well 16 months later.
2. Gygax[11]	Vulva.	Villi of hydatidiform mole.	—	Died of intercurrent disease. No secondaries found.
3. Lazarus and Schifrin[19]	Omentum, ovary, broad ligament.	Villi found.	Excision of nodules only.	Alive and well 6 weeks later.
4. Browne[4]	Vagina.	—	Subtotal hysterectomy.	Spontaneous regression of nodule in vagina.
5. Hertig[13]	Vagina.	'Malignant pattern'.	Hysterectomy.	Alive and well 1 year later.
6. Haines[12]	Vagina.	Syncytial cells in vascular spaces.	Hysterectomy.	Alive 5 years later.
7. Dickinson[7]	Vagina.	Syncytial cells in vascular spaces.	Nil.	Delivered of a normal infant 13 months later.
8. Novak and Seah[26] (C.R. 80).	Vagina.	Villus with trophoblastic overgrowth.	Hysterectomy.	Alive and well 4 years later.
9. Novak and Seah[26] (C.R. 65).	Lungs (regressed spontaneously).	—	—	Alive 4 years later.
10. Novak and Seah[26] (C.R. 154).	Vagina, lungs, femur.	—	—	Alive 4 years later.
11. Author (1959) ..	Vagina.	Villi of hydatidiform mole.	Hysterotomy. (Benign mole in uterus).	Alive and well 7 months later.
12. Miller[23]	Vagina, bladder, lungs.	Villi found in all deposits.	—	Died of haemorrhage from vaginal nodule.
13. Stevens[34]	Lungs.	Fragments of invading villi.	Induction of abortion of hydatidiform mole.	Died.
14. Novak and Seah[26] (C.R. 202).	Spinal lesion 1 month after hysterectomy.	No autopsy done.	Hysterectomy (Benign mole in uterus).	Died.
15. Novak and Seah[26] (C.R. 113).	Spine, lungs.	No autopsy done.	Hysterectomy (Benign mole in uterus).	Died.
16. Delfs[6]	Lung, spine.	Both lesions: villi of benign mole.	Lobectomy. Biopsy of spinal lesion.	Died some months later.
17. Pick[27]	Vagina.	Villi of hydatidiform mole (12 segments).	—	—
18. Wegelin[35]	Vulva.	Epithelial elements only.	—	—

TABLE 1: CASES OF HYDATIDIFORM MOLE WITH SECONDARY DEPOSITS (*Continued*)

Names of Authors	*Anatomical Position of Secondaries*	*Histological Picture in the Secondary Deposits*	*Treatment*	*Outcome (Where Known)*
19. Lacquer[18]	Vagina.	Villi found.	Hysterectomy. Excision of nodule.	—
20. Ruzicksa[28]	Vagina.	Villi found.	Hysterectomy.	—
21. Novak and Seah[26] (C.R. 31).	Lung. (Disappeared after radiotherapy).	—	Hysterectomy (Benign mole in uterus).	? Alive.

Ewing (1910)[9] in his classical article on choriomas, has collected reports of secondary deposits in hydatidiform mole from the literature and the following authors are quoted by him:

Apfelstedt (1896)[2] reported a case in whom a vaginal nodule was found to contain chorionic villi and which proved 'malignant'.

Neumann (1896)[25] and Kölomenkin (1900)[17] reported cases of chorioma (number of cases not stated) in whom recovery followed even after vaginal 'metastases' had been discovered.

Solwij and Krzyszkowski (1900)[33] found whole villi in the lungs of patients who had had hydatidiform moles.

Dunger (1905)[8] described 3 cases in which emboli occurred in association with hydatid mole.

Schmauch (1907)[29] collected 13 cases with vaginal metastases of trophoblastic tissue in whom recovery followed.

Ewing himself[9] reviewed 15 cases with secondary deposits of trophoblastic tissue. In 9, formed villi were present; in 3, the growth was atypical; and in 2, the pathology was indefinite.

Only 2 other papers have been found in which cases with hydatidiform moles and secondary deposits are given statistical presentation.

Findley[10] surveyed 500 cases of hydatidiform mole. This paper, in particular, is difficult to analyse in view of the confusing terminology employed. He states that 131 of the 500 cases developed 'chorion-epithelioma' and 157 developed 'chorioepithelioma malignum'. Of 290 cases separately studied, 124 (43%) developed 'malignant changes'. In this group 25 showed vaginal metastases; 21, pulmonary metastases and 4, cerebral metastases. It would seem that this group contains some cases which would now be classified as invasive mole.

Novak and Seah[26] have found 34 cases in their material which satisfy the criteria for a diagnosis of chorio-adenoma destruens. Of these, 26 were adequately followed up and, of this group, 6 died. They make no mention of the number who showed manifestations of secondary deposits but several of their cases reports are set out in Table 1.

COMMENT AND CONCLUSIONS

Statistical evaluation of the frequency of secondary deposits in hydatidiform mole is clearly not possible at the present time. When vaginal nodules, however, do appear their accessibility to biopsy makes a knowledge of their characteristics of great value in the diagnosis and treatment. Haines[12] states:

> 'Although a suspected diagnosis of chorion-carcinoma may not be discarded lightly, there is evidence to show that in some instances the appearance of a vaginal nodule has not such an unfavourable significance.'

Clinical Features of Vaginal Trophoblastic Nodules: The characteristics of the deposits in pregnancy, hydatidiform mole and in chorion-epithelioma are similar.[12]

Histological Features of Trophoblastic Nodules: Although Haines[12] describes two distinct types of pattern in vaginal nodules, it would appear, from study of the case reports, that a third pattern is of equal or greater frequency than his second type in 'benign' nodules.

Haines' first type is that associated with chorioncarcinoma and consists of clumps of Langhans cells with hyperchomatic nuclei and runs of syncytium, without villi. Blood vessels are blocked with tumour emboli and there is much haemorrhage. The second type is that in which cells of the syncytial layer are found dispersed in the connective tissue and are seen in association with the vascular endothelium.

Cytotrophoblast is not seen. This group is, he maintains, evidence of the benign nature of the deposit.

Consideration of the cases in Table 1 will show that, where the histological pattern is known, 10 cases were found to have formed villi in their secondary deposits while in only 5 were syncytial cells only, found. The majority of other authors quoted in this paper also find that formed villi constitute the most frequent picture in such deposits.

A third group in which formed villi, or parts thereof, are found may, therefore, be added to Haines' two groups as a further variation in the histology of secondary nodules. This group (in common with his second group) is of good prognostic significance It should be noted that intermediate types will also, almost certainly, be discovered. Further, in some instances all traces of trophoblastic tissue have been destroyed at the time of biopsy of the secondary deposit.

Treatment. Without attempting a complete statement on the treatment of cases with secondary deposits, it should be emphasized that there is, in our present state of knowledge, a clear place for conservatism in young women when the histological features of these nodules indicate a good prognosis.

It is clear that definite strictures will be laid down only when more careful studies, such as those of Novak and Seah[26] have been conducted in several, well-equipped centres with chorioncarcinoma registries.

SUMMARY

1. The pathology, pathogenesis and incidence of hydatidiform mole are briefly reviewed.

2. A review of the criteria of malignancy in trophoblastic tissue is presented.

3. The nature of invasion and embolization in chorionic growth is considered.

4. A review of cases with hydatidiform mole in which secondary deposits were found (including one case seen at Baragwanath Hospital) is presented.

5. The clinical and histological features of trophoblastic secondary deposits are described with particular reference to criteria suggesting a good prognosis in individual cases.

6. A plea is made for conservative therapy, in certain circumstances, in young women with hydatidiform mole with secondary deposits.

My thanks are due to Dr. D. W. P. Lavery, Senior Obstetrician and Gynaecologist, Baragwanath Hospital and to Dr. I. Frack, Superintendent of the Hospital, for permission to submit the case report for publication and for critical encouragement in the preparation of this essay.

REFERENCES

1. Aetius of Amida (6th century A.D.) quoted by Brews, A. (1939): J. Obstet. Gynaecol. Brit. Emp., **46,** 813.
2. Apfelstedt, A. (1896): Archiv. f. Gyn., **50,** 511.
3. Brews, A. (1950): *In* The British Encyclopaedia of Medical Practice, 2nd. ed., vol. 3, p. 483. Butterworth and Co., London.
4. Browne, F. J. (1950): *Post-Graduate Obstetrics and Gynaecology.* Butterworth and Co. Ltd., London.
5. Caturani, M. (1917): Amer. J. Obstet., **75,** 591.
6. Delfs, E. (1954): Quoted by Novak, E. and Seah, C. S. (1954): Amer. J. Obstet. Gynecol., **67,** 933.
7. Dickinson, J. R. (1955): Quoted by Haines, M. (1955): J. Obstet. Gynaecol. Brit. Emp., **62,** 6.
8. Dunger (1905): Zeigler's Beitrage zur path. Anat., **37,** 279.
9. Ewing, J. (1910): Surg. Gynecol. Obstet., **10,** 366.
10. Findley, P. (1917): Amer. J. Obstet., **75,** 968.
11. Gygax, M. (1931): Arch. Gynaek., **147,** 129.
12. Haines, M. (1955): J. Obstet. Gynaecol. Brit. Emp., **62,** 6.
13. Hertig, A. T. (1954): Quoted by Haines, M. (1955): J. Obstet. Gynaecol. Brit. Emp., **62,** 6.
14. Hertig, A. T. and Edmonds, H. W. (1940): Arch. Path., **30,** 260.
15. Hertig, A. T. and Sheldon, W. H. (1947): Amer. J. Obstet. Gynecol., **53,** 1.
16. Hippocrates (4–5th century B.C.) quoted by Brews, A. (1939): J. Obstet. Gynaecol. Brit. Emp., **46,** 813.
17. Kölomenkin (1900): Monatschr. f. Geburtsh. Gynäk., **12,** 744.
18. Laquer, W. A. (1945): J. Obstet. Gynaecol. Brit. Emp., **52,** 468.
19. Lazarus, J. A. and Schifrin, A. (1942): Ann. Surg., **1,** 93.
20. Marchand (1898) quoted by Findley, P. (1917): Amer. J. Obstet., **75,** 968.
21. Meyer, A. W. (1921): Contr. Embryol. Carneg. Instn., **12,** 203.
22. Meyer, R. (1906): Zeit. f. Geb. u. Gyn., **68,** 98.
23. Miller, J. (1924): Trans. Edinb. Obstet. Soc., **83,** 217.
24. Nesbitt, R. E. L. (1958): *In* Novak, E. and Novak, R. N. *Gynecologic and Obstetric Pathology,* 3rd ed., p. 528. W. B. Saunders, Co., Philadelphia.
25. Neumann, J. (1896): Monatschr. f. Geburtsh. Gynäk., **3,** 387.
26. Novak, E. and Seah, C. S. (1954): Amer. J. Obstet. Gynecol., **67,** 933.
27. Pick, L. (1902): Berl. Klin. Woch., 1189.
28. Ruzicska, G. (1948): A. Deb. Egy. Klin. Kozl., 311.
29. Schmauch (1907): Surg. Gynecol. Obstet., **15,** 259.
30. Schmorl (1897): Cent. f. Gyn., **21,** 1217.
31. Sherman, J. T. (1935): Amer. J. Surg., **27,** 237.
32. Shippel, S. (1958): Personal communication.
33. Solwij, A. and Krzyszkowski, J. (1900): Monats. Geburtsh. Gynäk., **12,** 15.
34. Stevens, T. G. (1927): Clin. J., **56,** 133.
35. Wegelin, C. (1936): Schweiz. Med. Wschr., **66,** 1196.
36. Willis, R. A. (1934): *The Spread of Tumours in the Human Body,* p. 133. J. and A. Churchill, London.
37. Willis, R. A. (1948): *Pathology of Tumours,* p. 986. Butterworth and Co., Ltd., London.

NOTES AND NEWS : BERIGTE

PEPTIC ULCER AND CORTICOSTEROID THERAPY

In view of the possible causation of peptic ulcer by corticosteroid therapy, a recent report from the Mayo Clinic is of considerable interest.

Bartholomew *et al.* studied 2,114 with rheumatoid arthritis seen at the Mayo Clinic between 1954 and 1957. The incidence of peptic ulcer in patients with rheumatoid arthritis was 3–4 times as great as the incidence in the general patient population at this Clinic.

The incidence of peptic ulcers was 8.1% in 877 rheumatoid patients who had not received systemic treatment with steroids, and 7.5% in 1,237 rheumatoid patients who had received significant steroid therapy.

A further feature of interest is the fact that gastric ulcer accounted for 7% of all ulcers found in the group which did not receive steroid treatment or received it intra-articularly, whereas the figure was 18.3% for those in the steroid-treated group.

* * *

RECENT PROGRESS IN OXYTOCIN RESEARCH

Dr. B. Berde is the author of a monograph on *Recent Progress in Oxytocin Research,* which has just been published by Charles C. Thomas, Springfield, Illinois, as a monograph in the *American Lecture Series* (No. 360).

The Sandoz Pharmaceutical Department in South Africa has a limited number of copies of this monograph available for distribution without charge.

Those medical practitioners interested should write to:

Sandoz Pharmaceutical Department,
P.O. Box 4461,
Johannesburg.

* * *

Dr. Allan I. Friedmann has been elected a member of the Jules Gonin Club, devoted to the international exchange and organization of knowledge on diseases of the retina and choroid.

The advent of light coagulation has so transformed the treatment of certain retinal and choroidal conditions, that the formation of such a Club became almost a necessity. It even has some members behind the Iron Curtain.

The Club is named after the ophthalmologist who first rationalized the treatment of retinal detachments.

Prof. E. H. Cluver, the new Dean of the Faculty of Medicine, University of the Witwatersrand, Johannesburg.

PREPARATIONS AND APPLIANCES

PROPCO ANALGESIC TABLETS

British Drug Houses announce the introduction of *Propco* Tablets, a new analgesic preparation.

Composition: Each tablet contains:
Paracetamol 200 mg.
Salicylamide 200 mg.

Indications: For the relief of pain and reduction of fever in influenza, arthritis, fibrositis, lumbago, earache, toothache and menstrual pains.

Advantages: Paracetamol is the first major metabolic product of phenacetin, but its administration does not give rise to the formation of methaemoglobinaemia, as sometimes occurs with phenacetin. Paracetamol appears, therefore, to be preferable to phenacetin in clinical use. Salicylamide is less toxic than aspirin; it is not hydrolysed to free salicylic acid and thus causes less gastric irritation.

Dosage: Adults 2 tablets every 4 hours.
Children under 12: half the adult dose.
No special precautions are necessary.

Packing: Cartons of 12, bottles of 25 and 100 tablets.

CLINICAL RECORDING EQUIPMENT

A new range of physiological recording equipment has recently been announced by New Electronic Products Ltd., of London. This firm specializes in high quality electronic apparatus designed to meet the needs of the most up-to-date cardiological and cardio-surgical departments.

Perhaps one of the striking features of the apparatus is its tremendous versatility. This is best shewn by the 6-channel photographic recorder, which consists of an amplifier trolley providing a portable housing for up to 6 of the many types of amplifiers obtainable. These include amplifiers for (*a*) phonocardiography, (*b*) electrocardiography, (*c*) extra-arterial or venous pulse waveforms, (*d*) single-ended or instantaneous pressure differentials for use during cardiac catheterization and (*e*) to amplify any direct current signal from such devices as the ballistocardiograph, electrokymograph, oximeter, densitometer, etc. In direct communication with the amplifier trolley is the recording camera capable of recording simultaneously on 12 cm.-wide photographic paper any or all of the amplified waveforms.

Used in conjunction with the amplifier trolley is the 2-channel cathode ray oscilloscope. This apparatus permits the direct viewing of any 2 phenomena from any of the selected amplifiers. An additional X-amplifier incorporated in the machine allows the display of a vector loop. The 4 sweep speeds correlate with those on the recording camera.

Of the smaller type recorders is a photographic 2-channel, ideal for routine cardiac catheterization studies, and a direct writer utilizing an ultra-violet light source and a special process-free photographic paper which enables the recordings to be made and viewed directly.

For quantitative or qualitative dye indicator techniques the Norman-NEP dye assembly permits either Evans Blue (T1824), indigo-carmine or tricarbocyanine (cardio-green) dyes to be used, density curves being recorded on a 15 inch wide Honeywell chart recorder. Technical specifications and sales data on all N.E.P. equipment may be obtained from the sole S.A. Distributors: Medical Distributors (Pty.) Ltd., P.O. Box 3378, Johannesburg or P.O. Box 195, Cape Town.

BOOK REVIEW

A NEW EPOCH IN TUBERCULOSIS

Bulletin of the World Health Organization: *Tuberculosis Issue.* (1959. Vol. 21, No. 1. Pp. 144. Illustrated). Geneva: World Health Organization. Pretoria: Van Schaik's Bookstore (Pty.) Ltd., P.O. Box 724.

For millions of people affected with tuberculosis throughout the world there is now hope of recovery, whereas previously there was little. The medical profession itself is faced with a change in methods of treatment and prevention that will probably alter its approach to the control of the disease. These are conclusions which emerge from two extensive investigations carried out by the World Health Organization in co-operation with a number of agencies and government authorities in India and in Denmark. The full accounts have just been published in the *Bulletin of the World Health Organization* (1959, Vol. 21, No. 1, 144 pp.).

The first of these is one of several long-term studies designed to answer the crucial question whether a case of tuberculosis can now be treated as effectively at home as in a hospital or sanatorium. The answer to this question may mean all the difference between health on the one hand and lingering illness, even death, on the other to countless individuals in the many countries of the world where adequate hospital facilities neither exist nor are likely to exist for a long time to come.

India is an outstanding example of such a country. In India there are 23,000 tuberculosis beds, while the number of active cases of tuberculosis is estimated at 1,500,000. It is clear that for years to come there can be no hope whatever of providing hospital or sanatorium treatment for all the tuberculous patients in the country. India was therefore chosen as the area for the clinical trials.

The carefully worded report of the Tuberculosis Chemotherapy Centre, Madras, does not claim that it has provided all the evidence to justify an immediate and total abandonment of sanatorium treatment. Ninety-six patients were treated at home, 97 in the sanatorium, for a period of 12 months, the patients being allocated at random to each series. All received isoniazid and PAS. The great majority had low incomes, even by Indian standards, and those at home lived for the most part in overcrowded conditions and had a less adequate diet and less rest than those in the sanatorium. In spite of these disadvantages, the results of treatment at home approached those of treatment in the sanatorium sufficiently closely to suggest that there may be little to gain from admitting the general run of patients to the sanatorium. If these preliminary results are confirmed by further investigations now taking place in India, a revolutionary change may occur in methods of tuberculosis control comparable only with those which have occurred in malaria control in recent years.

Less spectacular at first glance, but perhaps equally far-reaching, are the studies conducted in Denmark under the sponsorship of the World Health Organization. A nation-wide campaign was launched in 1950–1952 to assess the tuberculosis situation and to treat those found infected, and as a result of the information obtained it has been found possible to divide the population into high-risk and low-risk groups. The X-raying of the low-risk group, the authors of the study claim, could be greatly curtailed, the resources of the health services being thus set free to concentrate on preventive and follow-up measures for the high-risk group. Traditional methods of tuberculosis control should therefore be brought into line with present knowledge of foci of infection in the population and recent developments in chemotherapy, and this concentration on a relatively small group will bring nearer the ultimate goal of eradication, which has now passed in some advanced countries from the realm of pure speculation into that of reality.